NDD

your computer

AUGUST 1989
$4.50*
NZ $5.50 (Inc GST)

WIN A $13,500 25MHz AST '386!

MAKING YOUR MICRO WORK

ELECTRONIC MAIL — THE FUTURE

SPECIAL MONITOR FEATURE

MULTISCAN, HIGH-RESOLUTION, FLATSCREEN MONITORS, PLUS TERMINAL EMULATION

Assembling QuickBasic • LANtastic Networking

DTP Advisor • Framework III • IBM's Portable

Computers That Talk • CP/M Alive! • Lotus123R3

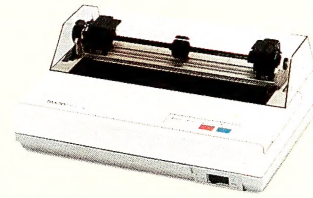
THE NEW PROFOUND FAMILY HAS A BROTHER!

Eastern Micro Electronics and Brother Celebrate A Family Affair.

Profound XT Compact plus Brother 1109 Printer for only $100 more!

The new Profound XT, a compact footprint case which houses one of the latest design motherboards and an 8088 processor. The LED displays the turbo switching speed of 4.77 Mhz to 10 Mhz. Packed with 640KB of RAM, a 360KB drive, a 20MB Hard Disk and Keyboard. The Profound XT supports a monochrome 14" Amber Monitor, DOS and we'll throw in a pack of diskettes!

$1,995 (For Profound XT only)



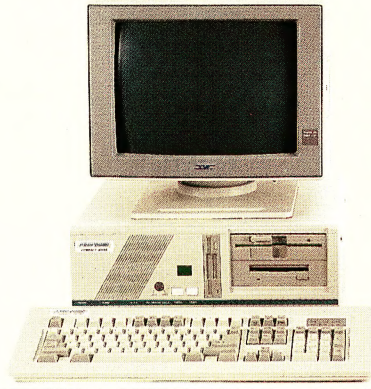
Also a compact size, the quiet 100cps, 80 column, 9 pin dot matrix printer has both parallel and serial interfaces, 2Kb buffer, Epson and IBM emulations. Tractor feed as standard. We'll even throw in the cable.

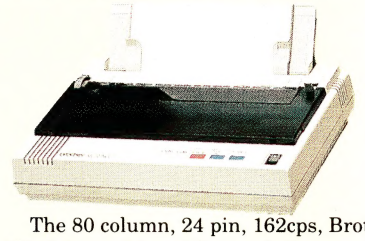
TOTAL VALUE $3,007 for only $2,095

Profound 286 plus Brother 1224L Printer for only $200 more!

The new PROFOUND 286 is as compact as our XT, and features a vertically mounted 3 1/2" slot. Turbo switching to a full 12Mhz, the 640KB RAM is driven by an 80286 processor on a state of the art motherboard. A 1.2MB drive and 40MB Hard Drive cover all your data storage requirements. Enhanced graphics adaptor card (EGA) and high resolution EGA Monitor measuring 14" and 640 x 400 pixels. Keyboard, DOS and even diskettes are included.

$3,695 (For Profound 286 only)





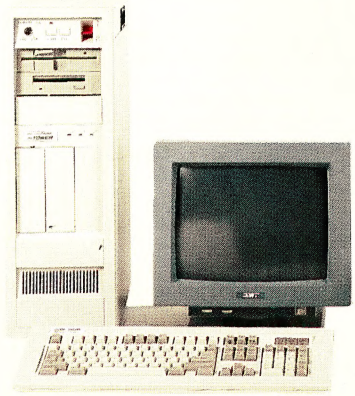
The 80 column, 24 pin, 162cps, Brother 1224L has a 54cps LQ speed. Coming standard with a 7Kb buffer, pull tractor feeder, Epson LQ500 emulation, dual interfaces and a cable thrown in!

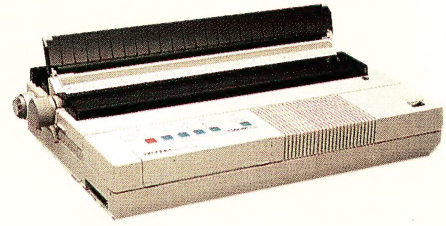
TOTAL VALUE $5,715 for only $3,895

Profound TURBO TOWER 386 plus Brother 1709 Printer for only $300 more!

The Flagship of the Profound Family is the PROFOUND TURBO TOWER 386. A powerhouse 80386 processor boosts the speed from 16Mhz to a turbo of 20 Mhz. With 2MB of RAM (capable of expanding to 8MB), and both 1.2MB and 1.44MB drives the system is accompanied by a 44MB Voice Coil Hard Drive, which will handle almost every processing and data storage option with plenty of space for expansion. The Video Graphics Adaptor (VGA) and a VGA Monitor give you unparalleled 720 x 400 resolution. Keyboard, DOS and diskettes for a towering price!

$6,995 (For Profound Tower only)





The Brother 1709 is a fast 240 cps, 136 column, 9 pin printer with standard features such as a 24Kb buffer, dual interface, push tractor feeder, paper parking, Epson and IBM emulation and many options.

TOTAL VALUE $10,640 for only $7,295

AUTHORISED DEALERS:

VICTORIA

JGB COMPUTER SYSTEMS: 12 Beach Street, Frankston, VIC. Tel (03) 781 2488.
INVOTEK COMPUTER SYSTEMS: 959 Glenhuntly Road, South Caulfield. VIC. Tel (03) 563 5556
WHITTLESEA COMPUTER SERVICES: Church & Beech Streets, Whittlesea, VIC. Tel (03) 716 1487
HARMAN COMPUTER SERVICES: 257 Seventh Street, Mildura, VIC. Tel (050) 21 2741
B&B COMPUTER SOLUTIONS: 19 Murphy Street, Wangaratta, VIC. Tel (057) 21 9277

TASMANIA

HI-TECH COMPUTER DISCOUNTS: 8 Criterion Street, Hobart, TAS. Tel (002) 343 525
PHOENIX COMPUTER SYSTEMS: 39 Queen Street, Ulverstone, TAS. Tel (004) 255 541

SOUTH AUSTRALIA

FIT AUSTRALIA: 1369 South Road, Bedford Park, SA. Tel (08) 374 0660

brother®

EME

EASTERN MICRO ELECTRONICS

For dealer and general information call: **VIC** (03) 699 3088 **NSW** (02) 212 6944 **SA** (08) 232 2277 **QLD** (07) 356 9988

HERE TODAY
HERE TOMORROW

As other computer companies fall by the wayside, it makes sense to invest in wholly Australian owned, Blue Chip stock. The Blue Chip range of Personal Computers are developed, manufactured, sold and serviced through the Australia- wide network of Blue Chip stores.

From the $995 Home Computer, through 386 Tower Power, to the largest networking solutions, only Blue Chip has the resources to meet your needs. Your computers are serviced by the manufacturer - throughout Australia.

Blue Chip Compact XT/88 from $1395.00

Blue Chip XT	2x360 FD	•	DOS	Mono	$1395
Blue Chip XT	1x360 FD	1x20MB HD	DOS	Mono	$1795
Blue Chip XT	1x360 FD	1x20MB HD	DOS	EGA	$2395
Blue Chip XT	1x360 FD	1x20MB HD	DOS	VGA	$2595
Blue Chip XT	1x360 FD	1x20MB HD	DOS	M/Scan	$2795

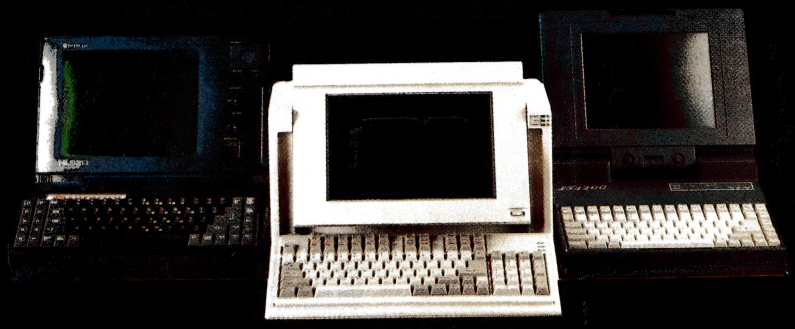
Blue Chip Compact AT/286 from $2395.00

Blue Chip AT	1x1.2MB	20MB HD	DOS	Mono	$2395
Blue Chip AT	1x1.2MB	20MB HD	DOS	EGA	$2995
Blue Chip AT	1x1.2MB	20MB HD	DOS	VGA	$3195
Blue Chip AT	1x1.2MB	20MB HD	DOS	M/Scan	$3395

Blue Chip Tower/386 from $6995.00
80386-20Mhz 2MB Ram Dos 3.4 1x1.2MB FD 1x1.44MB FD
1x42MB Voice Coil Hard Disk Serial/Parallel/Games Card
101 Keyboard VGA Card and Monitor
Please ask for any other configuration.

PROFOUND PORTABLE 286 SERIES
Gas Plasma Display 80286-12 1MB
84 Keyboard 1x1.2MB FD or 1.44MB FD
Ser/Par Card
20MB Hard Disk **$4495.00**
40MB Hard Disk **$4745.00**

PROFOUND LAPTOP 3200
Gas Plasma Display 640K Ram 80286-10
1.44MB FD Ser/Par
40MB Hard Disk **$4495.00**
3500 Model (EGA) **$4995.00**



HITACHI HL320 LAPTOP - Backlit LCD Display 8088 1x720KB DOS 1x20MB Hard Disk **$2250.00**

Australia's largest range of Hardware, Software and Peripherals

Rent-Edge Rental Plan Available to Business, Corporate and Government PE 30 Clients

VICTORIA: RINGWOOD (03) 870 2243
CARLTON (03) 663 7764
MOORABBIN (03) 553 4488
NSW: BROADWAY (02) 281 1044
CROWS NEST (02) 436 3655
WOLLONGONG (042) 26 3200
ACT: FYSHWICK (059) 80 7833
SA: ADELAIDE (08) 232 2555
QLD: KELVIN GROVE (07) 356 7722

BLUE CHIP
ELECTRONICS PTY LTD

THE NAME SAYS IT ALL

Editor
Jake Kennedy
Features Editor
Geoff Wade
Production Editor
Gavin Hammond
Art Director
Sally-Anne Silveira
Production Manager
Mark Moes
Production Co-ordinator
Kylie Prats
Consulting Editor
Matt Whelan
Editor-in-Chief
Brad Boxall
Publisher
Michael Hannan

EDITORIAL
AND OFFICE SERVICES
Milli Gordon
180 Bourke Rd,
Alexandria 2015 NSW
Tel: (02) 693 6620
Fax: (02) 693 6613

ADVERTISING SALES OFFICES
National Advertising Manager
Mark Wilde
New South Wales
Sales Executives
Chantelle Ferguson
Peter Kennedy
Charles Vales
180 Bourke Rd,
Alexandria 2015
Tel: (02) 693 6666
Fax: (02) 693 9935
Advertising Production
Patrice Wohlnick

Victoria
Sales Executives
Anne Willey
Chris Vaughan
3rd floor, 615 St Kilda Rd, Melbourne
Tel: (03) 525 1010,
Fax: (03) 529 2997
Advertising Production
Inga Tettmann
221A Bay St, Pt Melbourne 3207
Tel: (03) 646 3111,
Fax: (03) 646 5494

Western Australia
Des McDonald
48 Clieveden St, North Perth 6006.
(09) 444 4426
Fax: (09) 381 3115

Queensland
Graham Smith
26 Chermside St, Newstead 4006
Tel: (07) 854 1119

South Australia
Michael Mullins
98 Jervois Street, Torrensville 5031.
Tel: (08) 352 8666
Fax: (08) 352 6033

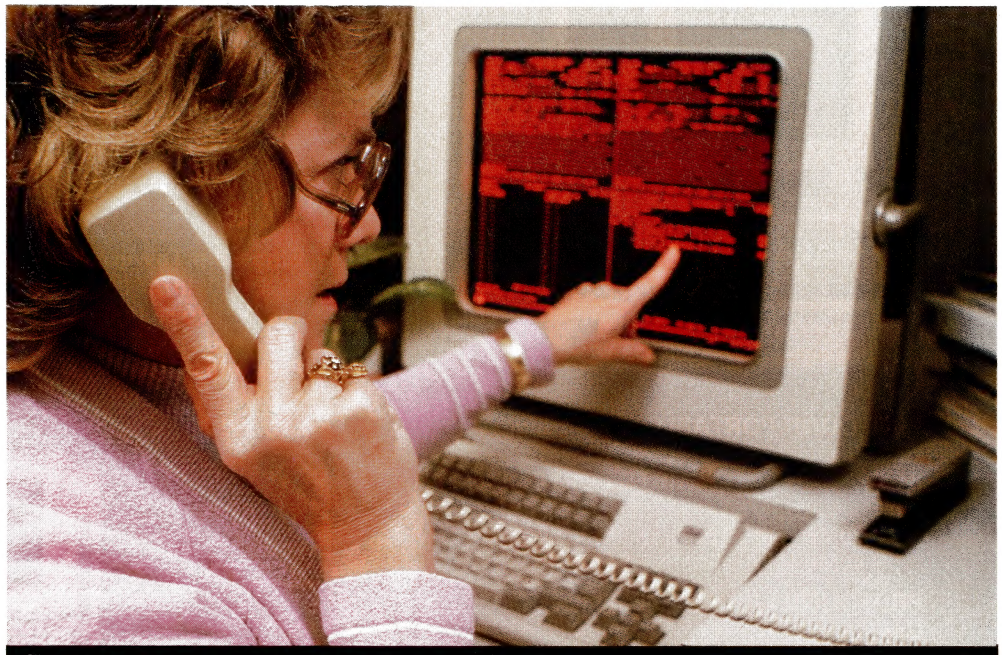
New Zealand
Gordon Marr
Rugby Press
67-73 View Road,
Glenfield, Auckland.
Tel: (09) 443 0252
Fax: (09) 443 0249

All Subscription Enquiries to the Subscriptions Manager
(02) 693 9517

YOUR COMPUTER
is published monthly by
The Federal Publishing Company,
180 Bourke Rd,
Alexandria 2015 NSW.
Printed by HannanPrint,
140 Bourke Rd, Alexandria 2015.
Distributed by
Newsagents Direct
Distribution Pty Ltd.
(02) 693 9517

*Recommended and maximum price only.
ISSN 0725-3931.

LANTASTIC NETWORKING 38



HELLO WORLD! 50

NEXT MONTH INCLUDES

THE TREND IN personal computing is power, power and more power – but for many uses, whether as a standalone machine or a basic 'workstation', all that power isn't necessary. Our survey of entry-level PCs will show the best value for money machines and help make the choice to suit the needs. Also, a special feature in this issue will advise on choosing and implementing a network for small to medium size businesses. We will also have the first of our State features, starting, this month, with Queensland. We haven't forgotten the power users: we'll continue our 'Accounting for Spreadsheets' series and present a new Paradox. And – a musical laptop!

This month's cover: photograph by Jay Freis/The Image Bank; screen graphics courtesy of Teco Australia and Thor Enterprises; cover design by Sally-Anne Silveira.

CONTENTS

AUGUST 1989

FEATURES

Monitor in-sight 18
Computer graphics have been with us since 1963 when Ivan Sutherland, then studying at MIT, put together a machine which 'drew' images on a cathode ray tube. Monitors have come a long way since then...

Flat-panel displays 30
With a minimum of the usual industry hype, flat-panel displays seem to be with us, although there are still improvements to be made.

A case of terminal emulation 34
As LANs develop, PC users are having to become acquainted with the world of mainframes – and terminal emulations. Stewart Fist decides there's no turning back...

LANtastic networking! 38
Nestled between the frustrated floppy carriers and the full-blown networkers, lies a market niche for low-priced, high-performance local area networks. That's where LANtastic from Artisoft fits in.

Hello world! 50
There are over 20 different ways to send 'electronic mail' but currently only several million active users in the world – why? In the first of a new series, Stewart Fist and Jillian Hamilton report on the present and the future of electronic messaging.

Computers that talk... and listen 68
Just like people, it's easier to make computers talk than listen... Craig Kirkwood looks at the latest developments in Natural Language Processing.

REVIEWS

An analytical spreadsheet 42
Lotus 123 Release 3 may bring a bizarre new twist to the lawsuits which have cursed the industry recently: the first impression is that Release 3 'looks and feels' like SuperCalc 5, according to Steve Keen.

Accounting for spreadsheets 62
Steve Keen begins a new series on spreadsheets and data analysis, with Framework III.

MCA on the road 76
IBM's new P70 is their best attempt yet at portable power, but it's more of a transportable than a laptop, says Paul Zucker.

DTP Advisor – good advice? 79
Is DTP Advisor a desktop publishing tutorial, a project management system or a case of computerisation for computerisation's sake?

INSTRUCTION SET

Counting out random numbers 84
Mike Allison shows that random numbers can be used to program games, investigate industrial problems and create fascinating graphics displays.

Assembling QuickBasic – part 5 102
So far in the discussion of assembly language routines for QuickBasic, only integers have been considered, but strings are also highly useful. Jeff Richards continues.

CP/M Alive! 104
Tom Moffat says there's still some life left in this operating system yet.

PUBLIC DOMAIN

New products 92
Turn your printer into a plotter, hyperdraw, run your PC remotely, GREP with the best and more!

The Prophet 108
BBS listing for Victoria and the Northern Territory.

dLetter 111
Execute files and help!

Your Atari 112
Basic and emulations.

Your Amstrad 116
Creating posters, help with Basic2 and more.

Your Commodore 120
Comparing Commodore and IBM PCs.

Rural Ram 122
Mapping the future.

Microbee File 124
The educational database Ways We Were.

IBM Underground 128
Yet more on archiving files!

Your Amiga 130
Hard disks and paint programs.

Your Mac 134
Will we ever reach the perfect piece of software?

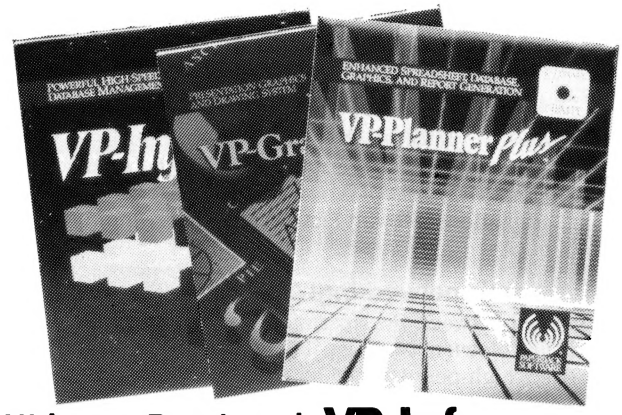
Your Apple IIGS 138
Entertainment software reviewed.

The Forth Column 142
Forth by the book.

Cursory Glance 146
A slice of the pi.

ONE STOP computer shop

VP Business Software - Sophisticated, Inexpensive Powerful, & Easy To Work With!



Spreadsheets Made Easy!

VP Planner Plus

The ultimate spreadsheet program! Outstanding features such as advanced mathematical and financial functions, graphics and list management make the VP Planner Plus a popular program for serious business use. But that's not all.... there's a special a multi-dimensional spreadsheet and data base function which allows you to easily draw information from VP Info or dBaseII/III and an inbuilt text editor and report generator. It's compatible with Lotus 1-2-3 files and keystrokes. Cat X-9205

$299

VP Graphics

Business graphics at its easiest and best! You can import in ASCII or DIF formats and create any of the standard business graphics - bar graphs, line, pie, X-Y line, etc, etc. Allows you to enhance graphs created by Lotus 1-2-3 or VP planner. VP Graphics also includes a complete complement of drawing tools - so you can easily create freehand drawings to add to your graphic information or even combine several graphics into a single more meaningful presentation. Plus there's a simple image editor and a wide variety of text styles and sizes. Supports any Microsoft compatible mouse. Cat X-9505

$199

The Ultimate Database! VP Info

An amazing database package with the power and performance your business needs! VP Info is a full relational database package which allows you to work on up to 6 data files at one time and combine the information to create a flexible, speedy method for handling huge amounts of data. It's much more than just a database, it offers an extremely powerful command language in which you can create pop-up menus and custom help screens. The command language comes complete with a compiler to ensure fast execution of your command files. And it's file and program compatible with dBase II/III format. Cat X-9302

$199

Keep Your Workspace Organised!

Computer Work Desk

High quality work desk designed especially for today's computer systems. Everything packs neatly away, leaving you room to work. Special features include cable tidy to keep all those messy leads and cables neat and out of harms way. With convenient slide-out keyboard drawer for a more comfortable working position - also keeps your keyboard dust free while it's not in use. Finished in high quality laminate that looks good, suits modern decor and is easy to clean. Cat X 3815

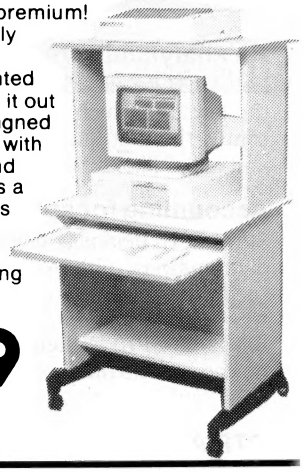
$299

Computer equipment shown is not included in price of furniture

Upright Computer Desk

Just what you need when space is at a premium! Our up-right computer desk is beautifully designed and made from high quality materials to assure a long life. It's mounted on convenient castors, so you can slide it out of the way between work sessions. Designed to make the most efficient use of space with storage positions for monitor, printer and CPU. Slide away keyboard drawer gives a comfortable working position and keeps keyboard dust-free while not in use. Neat and clean in appearance, it's finished in hard wearing laminate for long life and easy care. Cat X-3816

$299



DICK SMITH COMPUTERS

WE'VE GOT THE LOT!

Music from your PC!

Creative Music System

It's astounding! The Creative Music Synthesizer card simply plugs into your IBM PC or compatible and lets you create music on your computer system. There's 12 channels (Voices), stereo music output and 32 preset instruments for you to create your own tunes.
But that's not all! There's a stereo amplifier built into the Creative Music System which will drive speakers, headphones or your home stereo directly. You can actually define your own instruments, play background music while you work on your computer, create albums of your favourite tunes and play them in any sequence (it's fantastic for non-stop party music) or you can compose your own music.
What's more, the Creative Music System allows you to fully utilize the incredible 'Sierra' range of software! Cat X-2020

$299

"The Speech Thing"

Digital Sound Synthesizer

Here's great news for the serious experimenter! The Speech Thing is a complete hardware and software package which adds sound capability to your PC. It gives you a full featured 8-bit D/A (digital to analogue) converter, audio amplifier and software system which is capable of creating almost any sound. Converts text, either from keyboard or ASCII files, to high quality speech - just imagine, you can have a conversation with your computer! Installation is as simple as plugging Speech Thing into the parallel port and keyboard (comes with adaptors) and it does not interfere with their operation. Plus, it can be used in conjunction with the 'Voicemaster' (X-2038) to sample and edit digital sounds.
Cat X- 2036

$149

View And Edit Sounds With....

Voice Master Sound Input Card

The perfect match for "Speech Thing"! This analogue to digital (A/D) card lets you sample any sound, then view the waveform and edit it. Combine it with 'Speech Thing' and the recorded sound can then be played back. Voice Master comes complete with headset and software which allows you to experiment with voice recognition. With it you can set up to 256 different voice activated keyboard macros. For installation it requires an 8-bit expansion slot (XT & AT compatible). It's an amazing idea that's just perfect for the serious experimenter who wants a lot more from his computer system. Cat X-2038

$199

DS XPRESS

PHONE & MAIL ORDERS

ORDER BY PHONE - 008 22 6610 (LOCAL CALL FEE) OUTSIDE SYDNEY
SYDNEY AND ENQUIRIES - (02) 888 2105 FAX: (02) 805 1986
OR WRITE TO DS XPRESS, PO BOX 321 N/RYDE NSW 2113
ALL MAJOR CREDIT CARDS ACCEPTED. O/NITE COURIER AVAILABLE.
24 HOUR DESPATCH OF ALL ORDERS

JAKE KENNEDY

Which computer?

THE QUESTION we hear most often at *YC* is 'what sort of computer should I buy?' Our reply to that is 'what do you want a computer for?' Those who are looking for a machine for the office usually have their needs fairly well sorted out – most businesses that wish to start computing want accounting functions and/or some form of desktop publishing, so guiding them is fairly easy. But, more and more, the question comes from those who want a computer at home: either they simply want to know what computers are about or how they can be used – most people realise that computers, in one form or another, are increasingly playing a part in our lives and they don't want to be left behind; or, they want one 'for the kids.'

These are the difficult ones to guide. All we can suggest is that before making the plunge, they take the time to find out more about them. The worst mistake anyone can make is to go out and spend one to two thousand dollars, and then try to find a use for their investment. There is a very good chance, that the third biggest investment home computer users will make – after the house and car – is on the computer system: by the time they've bought the computer, then a printer, added a hard disk to an entry-level machine plus a colour monitor, and started to build up the software collection, the investment is going to run close to $2000 and it's not difficult to spend twice that.

Now, the worry is that after having spent all that money, the system ends up sitting, all forlorn, gathering dust, because not enough thought was put into what it was going to be used for, before it was bought. So – where to start?

First, friends and business associates may be able to offer guidance, but bear in mind their use for a computer may be different to the ultimate use you find for yours. Second, browse the computer section of a large book store: there are dozens of titles available in Australia aimed at those who wouldn't know a keyboard from a floppy disk – never mind if the jargon seems daunting at the beginning: after seeing the various terms in a variety of contexts, you'll be able to jargon it up with the best of them. (We can't really suggest computer magazines as a source of information for potential first-time buyers, because even *YC* is essentially written for those who have made the plunge and, unfortunately, of all the computer magazines in the newsagents, only about half a dozen are in Australia.)

Third – user groups. Each year in our October issue we publish a fairly comprehensive listing of user groups from Adelaide to Yarrawonga; and, most active groups publicise themselves in the local press. These groups are probably the best source of information you are likely to come across: whether it's help in deciding what sort of machine to buy or advice on getting that new software package to work with your computer, there's a good chance that someone in the group has had a similar problem.

Once you've been through those three steps, you should be ready for the fourth: actually venturing into a computer store. That's an entirely different adventure, can of worms and kettle of fish – so I'll leave it for next month. □

Future Features

IN ADDITION to our application stories and other informative pieces, each month we present features designed to keep you informed about the world of personal computing –

October 1989

Communications: Our in-depth coverage of electronic communications covers recent developments in 'connectivity' and presents an overview of the hardware and software that's bringing it all together – from the new generation of modems and fax cards to the latest in online services.

November 1989

Graphics: With the power now available to personal computer users, computer graphics have now come of age in almost every application environment. With particular emphasis on small business applications, we'll shows the exciting developments now taking place – including a special feature covering transputers and Risc-based machines.

December 1989

Integrated packages: Our survey of the latest full-featured offerings highlights the strengths and weaknesses of this growing range of flexible products. In addition, we present a detailed report on project management software and feature the latest in hand-held computers.

January 1990

Yearbook: Featuring our Annual Software Roundup of products reviewed in the previous 12 months, this issue will be packed with buying tips, reference material, application stories – and a look at the future.

February 1990

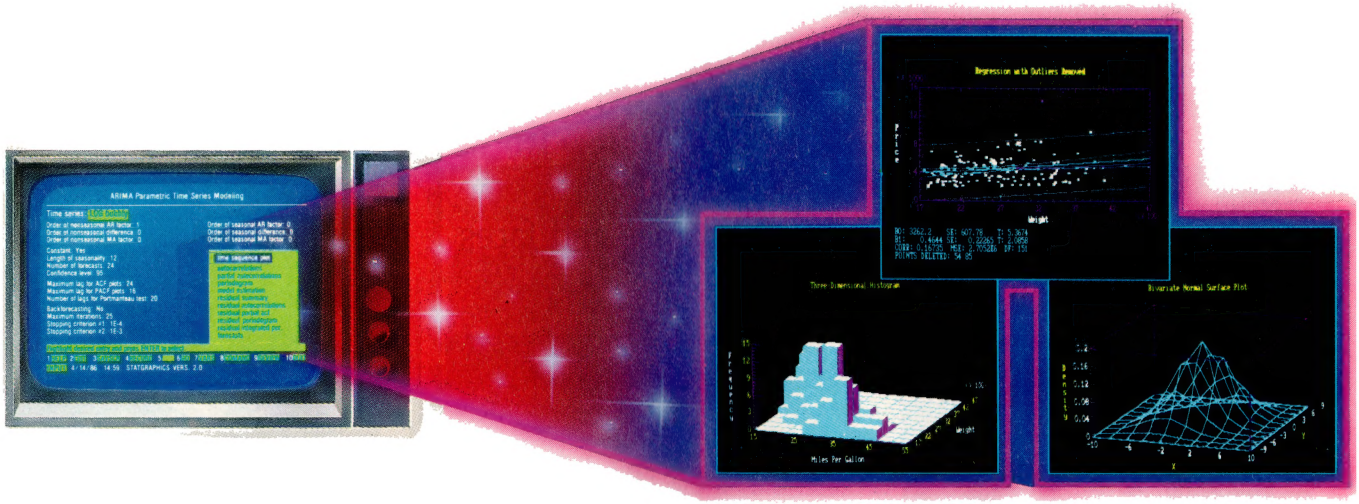
Portables: Our survey of the newest portables and the technology behind them shows that these machines have now come of age. And – a special feature on hardware and data security.

March 1990

Printers – Part 1: Choosing a printer is a matter of balancing speed, quality and price – our survey of laser and dot matrix printers will help you match a machine with your needs.

Application stories – particularly those with the same theme as our features – are always welcome. Please address editorial enquiries on our features to Geoff Wade, (02) 693 6143, and advertising enquiries to Mark Wilde, (02) 693 6646.

The most powerful and comprehensive Statistical Graphics System for your PC is also the easiest to learn and use



STATGRAPHICS®

Unique interactive environment

Forget what you have heard about months of study to master statistical graphics. STATGRAPHICS is completely menu driven so you can get into your statistical analysis work quickly and be productive right from the start. And, once you are in, there's no looking back. You can change between numerical and graphical analysis at will, altering variables as many times as you want, and see the effect immediately.

You can also enter and access data easily as STATGRAPHICS has a full-screen data editor and interfaces with standard ASCII files, Lotus 1-2-3® and Symphony® work sheets and dBASE® files.

Powerful statistics

STATGRAPHICS offers a full range of mathematical and statistical procedures. There are over 250 programs, including:

- ANOVA – balanced, unbalanced and nested designs.
- Complete regression analysis.
- Experimental designs for industrial statistics.
- Quality control charts.
- Multivariate and univariate techniques.
- Non-parametic methods.
- Forecasting and time series analyses.

Sophisticated graphics

STATGRAPHICS has a wider graphics capability than any other PC statistical software. It gives you the optimum presentation choice to suit the data, audience and situation from programs, such as:

- Two- and three-dimensional line and surface plots.
- Bar and pie charts.
- Histograms.
- Time sequence plots.
- Quality control charts.

And, you can change colours, labels, scaling and line and point types, or display several plots on the same screen.

STATGRAPHICS is part of the STSC, Inc family of PLUS ★ WARE products and is marketed and supported Australia-wide by McMullan Kilvington Pty. Ltd. Demonstration disks and training are available.

CAPSCO Australia Pty Ltd (Inc. in Vic.)
McMullan Kilvington

1-4 Layfield Street, South Melbourne, Victoria, 3205. Tel: (03) 690 4466 Fax: (03) 699 3327
2nd Floor, 32 Walker Street, North Sydney, N.S.W. 2060. Tel: (02) 954 4118 Fax: (02) 954 4354

STATGRAPHICS and PLUS ★ WARE are registered trademarks of STSC, Inc. dBASE is a registered trademark of Ashton-Tate. Lotus 1-2-3 and Symphony are registered trademarks of Lotus Development Corp.

STSC A PLUS★WARE™ PRODUCT

MasterCard VISA

Rudi Hoess

MENTION THE name Rudi Hoess to most computer journalists, and the words 'entrepreneur' and 'Apple' will probably spring to mind. Hoess was the founder of Electronic Concepts, the company which introduced the Apple range of personal computers to Australia. Hoess has also spent some time as the managing director of Computerland Australia, one of the country's largest computer store chains.

Hoess was educated in Munich, Germany and obtained an MA in Office Technology at the Munich Polytechnic, a qualification that would stand him in good stead for his later career.

These days, Hoess is the managing director of Megavision. In this role he supervises the company's introduction and marketing of computer peripherals and software to 'provide a viable alternative in the graphics market.' Megavision handles products such as Ventura, EIZO monitors, Viking large screen monitors, GSS X-Windows and Bitstream Fontware. He considers the greatest challenge in his present role as: 'keeping all the balls in the air, while the competition is after mine.'

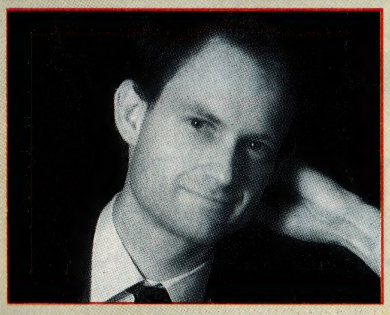
He is married with two children and lives in Castle Cove, NSW. When asked of his personal interests, Hoess said he was interested in the: 'promotion and awareness of benefits derived from proper and future use of computers, computer orientated education, fast cars, fast women (they are, by now, all too fast for me) and advertising concepts.'

Would he be doing something different? 'No, I am doing exactly what I want to be doing,' Hoess said.

INTRO-FACES

Each month we introduce you to the names and faces behind the computer industry.

Jodee Rich



JODEE RICH is probably one of the more famous characters of the personal computer industry, and with just cause. One of the founders of Imagineering Technology Ltd, Rich has expanded his business from a small company set up in 1981, and employing three staff to distribute Apple software to what he claims is Australia's largest microcomputer distributor, which as well as a range of software, peripherals and accessories, now markets a range of personal computers and employs 250 people in seven countries.

This success he attributes to 'marrying an efficient distribution company with careful marketing strategies.' As the managing director of Imagineering, Rich's daily work involves: 'not only the day to day management of the distribution and marketing of the company, but also planting seeds for future diversification and growth.'

After matriculating from Cranbrook Boys' High School and then, completing a Bachelor of Economics, his career began in 1981 when he and two of his friends co-founded Imagineering. To establish the company, Rich used financing from an aquarium leasing and maintenance business (some $20,000) which he started when he was 13 and borrowed a further $30,000. The company achieved a turnover of $100,000 in its first year. To this day, Rich keeps a fish tank in one of Imagineering's meeting rooms as a reminder of how the business began.

Rich has been for about a year to his 'long-time girlfriend, Maxine'. When asked what he would rather be doing, Rich replied: 'There's nothing at this stage I'd rather be doing. However, I have always wanted to fly and intend to do just that later this year.'

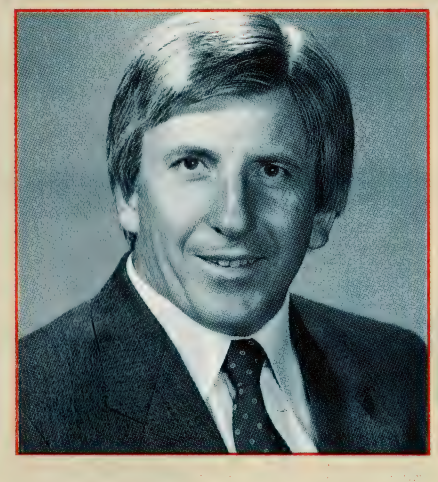
Jennifer

THE CAREER of Jennifer Zanich began after qualifying from the Western Australian School of Dental Therapy as a Dental Therapist. As a Dental Therapist, she Zanich performed operative dentistry on children throughout the Western Australian school system, including several years in the remote north-west of the state. In an effort to explore her talents beyond dentistry, she moved to London for several years.

The time in London was spent exploring various industries and Zanich recalls the most exciting as having been her work in the foreign exchange and a US publishing company, a decision which would greatly influence her career later on.

Zanich had always wanted to work in the computer industry, and it was shortly after returning from London, and moving back to WA, that her opportunity arose. While working for NEC and gaining wide experience of the

Graham Hobbs



GRAHAM HOBBS' career began in 1968 after qualifying in the field of electrics and electronics at the North Sydney Technical College. Since then, Hobbs has gained 20 years experience in many facets of the computer field, conventional typesetting and desktop publishing. As Hobbs himself puts it, he has acquired a 'rare and valuable blend of technical, marketing and management skills.'

His first position was that of Technical Manager with VRG Graphic Machinery and there he established training schools, a service network and also got involved with sales and support activities. Eight years later, Hobbs was declared general manager of VRG, and five years later he was promoted again, and appointed to the board of directors.

However, in 1982, VRG Graphic Machinery was acquired by Aldus and, while Hobbs was invited to stay on with the new company, in 1985 he moved on to join Commercial Dynamics as a management consultant where he restructured and rationalised activities undertaken by the company.

In 1987, Hobbs was approached by Rank Xerox to join the head office executive team and there he established a new division focused on Vax- and mainframe-based laser printing and publishing systems. This role soon changed to include the marketing of desktop publishing software and is Hobbs' current position. Hobbs believes his greatest challenge in his present role 'to be maintaining year on year growth whilst preparing my staff to accept broader responsibilities as the business environment changes.'

His personal interests include: family leisure activities, staying abreast with high technology, robotics, machine vision experiments and motion detection. He also enjoys a game of tennis and bushwalking. If given the opportunity, Hobbs would rather be 'exploring the Australian outback in a four-wheel drive vehicle over the next six months with my family.'

Zanich

inner workings of a computer company, Zanich was approached to set-up a distribution channel for Microsoft's products in the then 'State of Excitement'. With a group of accountants, Zanich co-founded MicroSL, the (then) exclusive distributor for Microsoft in WA.

From there, she started work with Microsoft itself, relocating to Sydney to assume the role of training and promotions manager and this eventually led to a promotion to her current position of national marketing manager where Zanich looks after the marketing for Microsoft and all its products in the Australian market. In this role, she looks after the systems and application product range, public relations, advertising, Microsoft's Communique Club, customer service, and a variety of other tasks.

She considers her greatest challenge to be positioning and marketing Microsoft through the 1990s and the technological changes the new decade will bring and trying to market the company as a systems house, rather than just a company with a well-known word processing product. And, she added, 'not having a nervous breakdown.'

When asked of her marital status, Zanich said she was single. 'I ask a lot a people but they say no,' she joked. She is more than happy with her career at the moment: 'I wouldn't change what I am doing now,' she said.

Ron Nabors

RON NABORS, president and managing director of Remington, believes that his greatest challenge in business is to ensure Remington achieves the delicate balance between short-term success and sufficient investment necessary for a fruitful, long-term future. 'Achieving that business is not easy, but there are simple initiatives that can be taken to assist in achieving that goal,' he said.

'Firstly, one must develop a strong reliable customer base and put a lot of time and effort into maintaining a good trusting relationship with those clients. Of equal importance is the need to invest the right amount of effort in selecting the right employees, providing extensive training for them and developing an environment of open communication and trust between management and staff.'

Nabors says that both initiatives are 'critical' to long term success and he also feels that research and development and management structure play key roles in the future of a company. 'The computer industry has had a large number of high fliers come and go in recent years,' Nabors noted. 'Within the computer and office equipment industry it is fairly easy to achieve short-term success, but maintaining a good operation over an extended period of time is the key to real success.'

As a personal challenge, Nabors considers keeping up with the latest in technology as 'one of the most tangible challenges. In the early 1990s, technology will change at an ever-increasing pace, especially within the computer and related industries.' However, a greater personal challenge than this, according to Nabors, is 'the need to keep up with needs and expectations of customers as well as the changing values and expectations of employees.

'I have seen a lot of executives rise in their careers only to fall away because they have failed to keep pace with change. They don't meet the challenge of keeping up with the changes in technology, business practises, customers and employees. I aim to maintain the self discipline required to stay in touch with this changing world,' Nabors said.

CANBERRA COMMENT

WILLIAM OLSON

A tender tale

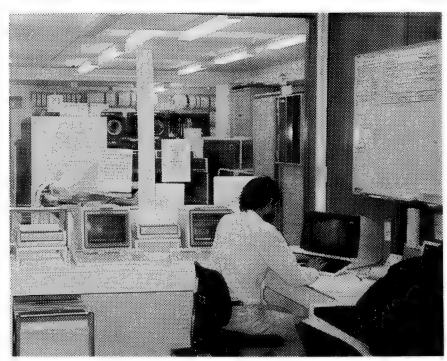
TENDERNEWS IS A quarterly publication produced from information in the *Government Gazette*. However Tendernews is not a government operation – it is owned and operated by Richard May here in Canberra. Basically, it offers, a breakdown of Federal government spending, department by department, with all categories such as computer purchases listed. May says that although government regulation 52 compels all departments to list their purchases in the *Government Gazette*, only 50 per cent actually appear. 'The rest remain unlisted,' May pointed out. 'However, Tendernews is putting the pressure on departments to list more of their spending.'

According to May about 15,000 public servants have some input into the *Gazette* each quarter – and, even with all 15,000 working on the information they still cannot get it right. One of the slackest departments is the Prime Minister's. It claims, for example, to have spent only $8929 on computer equipment in the last quarter. Tendernews suggests a previously noticeable trend of slow or inaccurate reporting to the Government Gazette by the PM's Department has continued over the past 12 months. In that time the PM's Department has spent only $224,000 on computers while other departments have, by comparison, splurged.

Tendernews also allows computer companies to see where their competitors are selling in government and in what amounts. May also supplies an Open Access database of around 12,000 names and positions of public servants who might be useful for business contacts. About 5,000 of the names are listed with the Defence department. The hardware used is a Spring 386 with a 71Mb hard disk running at 20MHz linked to a Canon laser printer.

Tendernews says an exact $600 million listing of the IBM Desine defence contract looks suspiciously like creative accounting. Because the complete Desine contract will run for five years, a $600 million contract figure at this stage seems a surprisingly confident prediction. Overall government computer spending in the most recent quarter is up 73.5 per cent on last year. This is without taking into account the $600 million Desine contract.

Computers accounted for more than half of the $1.36 billion government purchases in the past 12 months. Tendernews predicts that total government computer spending for the 1988-89 financial year will exceed $250 million. This has boosted the number of private computer companies in the ACT. Canberra now has 500 computer businesses listed in the phone book – an increase of 120 in the past 12 months.



DP Manager Johan Vermeij of the Civic Advance Bank in Canberra described their system (pictured) as a 'living example of great things with a small team.'

Desine still in trouble

EIGHT COMPUTER companies currently supplying the Defence department have formed an industry defence group. The chief executives from the companies, Concurrent, ICL, Wang, Unisys, Sun, Sigma Data, Prime and NCR met in Canberra recently to discuss common problems arising from the IBM Defence Desine contract. Co-ordinator for the group, Geoff Billingsly from Prime, indicated that all the companies were concerned about the way the Desine contract was now apparently tied in to the IBM SAA standard.

When Defence accepted the notion of SAA as part of Desine it was still vapourware and the IBM SAA application, Office Vision, will not be available in significant numbers until next year. However, IBM are reported as saying they will offer software bridges and hardware gateways to OSI. The Defence Computer Industry Group claims that sections of the military are also worried about compatibility between their existing systems and proposed Desine equipment using SAA.

There is concern, too, about the true cost-effectiveness of Desine. The DCIG group believe that giving all Defence business to IBM may prove an expensive choice and the evidence from Tendernews supports this claim. While the Defence department has now listed the cost for Desine at a neat $600 million, earlier this year estimates were between $400 and $500 million. IBM has also (apparently) suggested new machines for some defence sections when upgrades for existing equipment would have been satisfactory.

Meanwhile, questions were being asked about Desine in the Senate. The Senate estimates committee had about three dozen questions on notice to the Defence department concerning Desine. After threats from the Opposition to block Defence appropriations, some answers appeared. Unix featured in several questions – for example, one question asked if NATO and the US Defence Department have both adopted Unix as their operating standard. The Defence department replied that it 'continues to monitor the position of its allies in regard to information technology standards.'

Another asked if Unix had been evaluated as part of Desine. The answer from Defence said that Unix was evaluated but was thought deficient in network management and security. Geoff Walker, assistant

secretary of the Defence information systems policy division, said recently 'The idea that Unix would now be off the order list is mistaken.' Walker said that when tenders closed for Desine in 1987, Unix was not widely considered. However, it was now being thought of as the system for the 90s.

Malaysian DP

SETTING-UP A banking Data Processing system in Kuala Lumpur was a real headache for DP manager Johan Vermeij. Now back in Canberra, Vermeij said the Malaysian experience was unlike anything he had faced before. 'When you work in a production environment as I do, you have to be very sharp – you can't just say this doesn't work, I'll forget it until next week,' Vermeij said. 'In production as soon as you put it in the system, if there's a problem it comes back to you.'

'The Mongolian Horde syndrome is a well-known DP problem. If a software project is late, putting more people on to it only makes it later. Small software groups respond much faster.' ***Vermeij, commenting on his experience in Malaysia.***

Vermeij said when he started work in Kuala Lumpur it was like a development 'toyshop'. The DP programmers were not even doing backups. The other problem he faced at the beginning with the software was no terminal access to the system, so that was the first priority. Getting the users to explain exactly what they were doing from day to day was also tricky. Vermeij worked on the contract alone except for one assistant. 'There is plenty of competition among banks in Kuala Lumpur – they have over 30 banks and they all want ATMs.

Vermeij said the attitude of Malaysian computer people was generally to cover up and not take responsibility. 'People there don't really like taking responsibility because if they make a mistake they might get sacked. Then there's a good chance they will never work again. I found myself on call day and night asking me to make all decisions – however towards the end of the contract the locals were starting to make some decisions.'

Pay rates for experienced DP people in Kuala Lumpur vary between $1500-$3000 Malaysian a month ($A700-$A1400). Vermeij said graduates were taken on for 12 months at $500 Malaysian ($A200) a month. After 12 months they keep the good ones then 'throw the rest away.' The size of any DP team should be as small as possible using high-quality people Vermeij says. 'If you work in an application environment you have to know what you are doing. You see a lot of people and all they know is computers but they don't know what they are doing really. Another problem is empire building where DP sections try to lock themselves away and live at a different level. They see users as unimportant – they think everyone is there to serve the DP section.'

'The Mongolian Horde syndrome is a well-known DP problem,' Vermeij noted. 'If a software project is late, putting more people on to it only makes it later. Small software groups respond much faster. Also with many projects developers start encoding too early. Then they have to backtrack and start again – coding should only be a very small part of a project.'

Vermeij is now the DP manager for the Civic Advance Bank in Canberra. He works with a team of eight using an NCR mainframe coupled to an HP1000 front end. He says the system 'is a living example of great things with a small team.'

Correction

DR BRUCE CORNELL from the Australian Membrane and Biotechnology Research Institute advises that the item in February's Canberra Comment about Animal Chips was wrong. AMBRI's work with micro sensors has nothing to do with animals or animal cells. □

Xi Plus Statistics

AN EXPERT SYSTEM from the UK called Xi Plus is helping drive a graphics package producing publication-standard charts for the Australian Bureau of Statistics. Cheryle Lomas from the ABS in Canberra says Xi Plus is a user-friendly interface for their Mirage graphics package. 'We needed an easy-to-use package because Mirage has many control codes and is difficult to learn on its own.'

Bill McDonald from ABS said training programs for Mirage normally take two days 'and this is just for a very basic understanding of Mirage. Now that Xi Plus is in place we have saved on training time for Mirage.' Xi Plus in conjunction with Mirage produces graphs for ABS publications. 'There is a publishing standard for ABS publications and ACE (ABS Expert System) delivers that standard,' McDonald noted. ACE is now installed in all state offices of the ABS including Darwin.

Unlike some other expert systems, Xi Plus has natural language interfaces, uses windows and pull-down menus. It is ideal in areas where extensive sets of rules or conditions must be met. For example, in the UK Xi Plus is used for an expert system giving information about the laws on unfair dismissal.

AN EXPERT SYSTEM from the UK called Xi Plus is helping drive a graphics package producing publication-standard charts for the Australian Bureau of Statistics. Cheryle Lomas from the ABS in Canberra says Xi Plus is a user-friendly interface for their Mirage graphics package. 'We needed an easy-to-use package because Mirage has many control codes and is difficult to learn on its own.'

Bill McDonald from ABS said training programs for Mirage normally take two days 'and this is just for a very basic understanding of Mirage. Now that Xi Plus is in place we have saved on training time for Mirage.' Xi Plus in conjunction with Mirage produces graphs for ABS publications. 'There is a publishing standard for ABS publications and ACE (ABS Expert System) delivers that standard,' McDonald noted. ACE is now installed in all state offices of the ABS including Darwin. Data for graphs and charts can be either keyed in or imported from disks.

Unlike some other expert systems, Xi Plus has natural language interfaces, uses windows and pull-down menus. It is ideal in areas where extensive sets of rules or conditions must be met. For example, in the UK Xi Plus is used for an expert system giving information about the laws on unfair dismissal.

MicroGram COMPUTERS

CORDLESS MOUSE

* No more tangled cables
* Uses infra red transmission
* Auto select between Microsoft Mouse and Mouse Systems PC Mouse
* Resolution 200 DPI
* High traking speed 600 mm/sec
* Two or three button operation
* Auto turn off to conserve batteries
* Additional (fourth) button provides speed dependent resolution (Slow movement, fine control - rapid movement large cursor steps)
* Menu maker software and mouse driver software included.

$160.00

DATA SWITCH BOXES

Manual AB and ABCD Switch

* Share one printer/plotter with multiple computers
* Switch one computer to multiple printers etc.

Two way parallel	**$65.00**
Four way parallel	**$75.00**
Two way serial	**$65.00**
Four way serial	**$75.00**

Manual Crossover Switch

* Share (cross over) two computers with two printers **$75**

Automatic AB and ABCD Switch

* Automatically switch output from multiple computers to one printer

Two way parallel	**$120**
Four way parallel	**$170**

8 BIT A/D - D/A CARD

* 64 8 bit A/D channels.
* 2 8 bit D/A channels.
* 24 digital I/O lines programmable as input or output.
* 3 independent 16 bit counters.

$349.00

Also available:

12 bit A/D - D/A	**$305.00**
14 bit A/D - D/A	**$430.00**
16 bit A/D - D/A	**$480.00**

DIGITAL I/O CARD

* 48 Digital I/O lines programmable as input or output.
* 16 channels have LED status display.
* 3 independent 16 bit counters.

$135.00

IC TEST CARD - NEW VERSION

* Tests 54/7400, CD45/4000 and MC145/140 series chips.
* Tests 4164, 41256, 41416, 41000 DRAM chips.
* Will identify unkown chips from library.
* LOGIC LIBRARY USER UPGRADEABLE.
* Add logic functions to the library for new chips or custom PAL, FPLA, PROM etc. **$280.00**

EPROM WRITER CARD

* Programs 2716, 2732, 2732A, 2764, 2764A, 27128, 27128A, 27256, 27356A, 27512, 27512A.
* Read EPROMS and save to disk.
* Read from disk and write to EPROM.
* Modify EPROM.
* Blank check.

Single burner	**$190.00**
Four burner	**$360.00**
Eight burner	**$525.00**

ALSO AVAILABLE

* 8748/49/50/41/42 Writer Card **$395.00**
* Bi-polar PROM Writer Card **$465.00**
* PAL Programmer Card **$535.00**

A4 MONITOR

* A4 (Portrait) monochrome multisync monitor complete with VGA interface card.
* 15" diagonal CRT.
* Resolution up to 768 x 1024.
* Black on white or white on black reversing switch.
* Tilt and swivel base.
* Drivers for popular software programs.

$1490.00

EEMS CARDS

* Capacity 2Mb per card, 4 cards per system
* Will backfill conventional memory to 640kb.
* Comaptible with EMS and EEMS memory to run with Lotus 1-2-3, DESQview II etc.
* Driver software included as well as print buffer and RAM disk utilities. (includes LIM 4)
* XT or AT versions
  0kb RAM **$230.00**

COM2 SERIAL KITS

* Chip set: 8250, 1488, 1489.
* Cable: 26 pin, single 10 pin or 2 by 5 pin to back plane 25 pin D connector. **$25.00**

NEW BAR CODE READERS

* Selectable keyboard interface (connects between keyboard and computer) or serial interface.
* Bi-directional scanning.
* Will autodiscriminate most barcode symbologies eg.UPC/EAN/JAN/Code 39/Interleaved 2 of 5.
* Barcode printing software included. **$450.00**
* Barcode slot reader with above features. **$600.00**

BARCODE PRINTING SUBROUTINE

* Language independent.
* Compatible with dot matrix and laser printers.
* Will mix text with barcodes.
* Select from 7 standard barcodes.
* Selectable height, density, no of strikes and printer type. **$190.00**
* Stand alone programs also available. **$140.00**

EXTENDED MULTI I/O CARD

* Two floppy disk drive controller, any combination 360/720/1.2/1.44 drives
* Two serial ports (one optional)
* One parallel port.
* Realtime clock
* Games Port **$135.00**

FOUR FLOPPY DRIVE CONTROLLER

* Supports any combination of 360/720/1.2/1.44 floppy drives.
* Suitable for XT, AT and 386 computers.
* Implements 720/1.44 drives on AT without motherboard BIOS support. **$135.00**

"EXTERNAL" FLOPPY DRIVE CONTROLLER

* Allows two addtional floppy disk drives to be fitted (beyond A: and B:)
* Supports 360/720/1.2/1.44 on both XT and AT computers
* No need to replace existing hard disk floppy disk controller cards
* "External" drive(s) may be mounted internally with 34 pin header and ribbon cable or externally via 37 pin D connector.

$135.00

DIGITIZER

* Digitizer input pad for AutoCad etc.
* Allows command menus to be set up on the active area as well as digitizing existing drawings.
* 297mm x 297mm active area.
* Four button cursor.
* Summagraphics compatible.
* Accuracy 0.025".
* Also compatible with Microsoft Mouse and Mouse Systems Mouse.
* Macro software allows a series of keystrokes to be assigned to the macro area of the pad for any software.

$889.00

5m PRINTER CABLE

* Standard IBM printer cable 5m long **$30.00**

All prices include Sales Tax.

Fax: (043) 34 1334 **Phone: (043) 34 1544**

17 Barry Street, Bateau Bay NSW 2261

Dealer Enquiries Welcome

Bankcard VISA Packing and courier charge $8.00 Australia wide

HOWARD KARTEN

Closely monitored

I WENT DOWN to the monitor store. I knew I was in trouble a few microseconds after I walked in. 'Are you looking for CGA, EGA, or VGA?', the salesman asked solicitously, clearing his throat to launch into a full sales pitch. I cursed myself as I realised instantly how short-sighted I'd been in not following every development in the monitor world. Now I was about to pay for my cavalier attitude. From somewhere deep in my gut, an emergency transmission went into auto-broadcast mode: 'Warning! Warning! Pre-emptive knowledge strike is about to begin! Incoming manipulative statements expected! All posts to condition Red! This is no drill!'

The strange jargon the salesman was speaking made it crystal clear that I'd become seriously out of touch with developments in the world of monitors. About seven years out of touch. I decided to stall. I searched internal memory at high-speed, seeking any defensive strategy for unexpected sales pitches that had good effectiveness and most flexibility. I initiated it with only milliseconds to spare: 'Uhh. . .

The salesman took that as a challenge. 'You can take this baby to the beach with you. Works in full sunlight; comes with an optional suntan lotion dispenser,' he said, warming to his task as he reached for the first item at hand. He seemed to be having some trouble separating his words as he spoke; it was as if his mouth were operating at only 300 baud, while his mind was working at 2400 baud. He began to remind me of some of the unfortunate caffeine freaks I'd seen stumbling around Wall Street recently.

'. . . only two thousand dollars, Australian,' he was concluding. He'd obviously had me pegged. For some reason, he decided to pull back. 'Is there any particular colour you're looking for? We have black and white, and black and yellow in stock, but we can get others,' he purred. I decided it would probably not be cricket to ask whether there was any research data showing which colour was best, so I indicated that that was not a major problem. Any colour would be fine as long as it wasn't fluorescent, I mumbled.

'We have a new screen that shows you a full 50 lines,' he continued. 'And if you're tired of staring at the small screen' – he stopped to let me know this was a small joke – 'we have this baby here, which will let you sit in comfort in an easy chair and work from across the room.' Sure, just what I needed; everyone I know feels that tension is about the best driving force there is to get the job done right and on deadline, though I suppose there could be someone, somewhere, who can turn out good stuff from a relaxed posture. I'll bet that person probably lives in a rubber room somewhere. The salesman grinned, showing a gold tooth, to let me know that he thought it was a joke, too, but that if some rube with more dollars than sense came along, he wouldn't hesitate to unload the big screen.

I find that I want to make a note or underline something, at least until I can get out a piece of paper. But the ink never sticks to the glass.

Taking a different tack, he steered me over to another section of the store. 'How about these flat-panel LCD displays?' he asked. He'd obviously been through the training class on jargon, since he pointed out that the unit was only 50 millimeters thick and therefore 'would not take up precious real-estate on your desk.' Perhaps it would speed things up if I took the initiative. I thought of that greasy streak that periodically appears, running down the middle of my terminal. 'I find that my screen seems to accumulate a lot of dirt and grease. You don't happen to have any self-cleaning models, do you?'

He raised a corner of one eyebrow and looked at me as if to suggest that there was a gravy stain on my strait-jacket. In the interests of letting him know who was boss, I decided to try to put him on the defensive. 'Well, there are self-cleaning ovens, aren't there? I guess you just don't have that model I saw in New York. '

I persisted. 'Well, do you have a monitor with a built-in backup power supply that will last, say, two minutes?' I was thinking of the power shortages that periodically hit my area. Power cuts always seem to occur just after I've put my most brilliant material onto the screen; keeping the screen lit for even two minutes might let me salvage something. Again, it was no dice.

I decided to take a chance. 'What about one of those fancy new Japanese gismos I heard about, that lets you pop-up a beautiful, high-definition colour television picture onto a corner of the screen? With a button that you can push if the boss comes up behind you suddenly?' I noticed that the somewhat stiff expression on his face had not changed in at least five minutes.

He seemed to be in orbit, so I thought this was a good chance to try an experiment I'd often thought about. Putting on my straightest, most serious face and playing dumb, I said, 'you know, sometimes, when I'm reading stuff on my screen, I find that I want to make a note or underline something, at least until I can get out a piece of paper. But the ink never sticks to the glass. Is there some kind of screen that will hold the ink until I wash it off?' I couldn't tell whether his eyes really

rolled, or whether it was my imagination.

For some reason, that reminded me that there were some manufacturers who made little 'thingies' that attached to monitors, like copy holders. 'Maybe there's a way I could upgrade the monitor I have now... is there such a thing as a plastic pencil holder I could attach to my monitor? A coffee-cup holder? A little stick-on mirror that would let me see when the cat was behind me, poised to jump on the keyboard?'

All this was obviously getting me nowhere, although it was getting the salesman more exasperated. But then, all of a sudden, he had an idea – almost as if a message suddenly popped up on his mental monitor. He took me into an area marked 'Staff Only.' 'This experimental model came in last week,' he said as he grabbed a box that was the same size as a standard software package. Inside were two small monitors, each perhaps 40 millimeters on a side and surprisingly lightweight. An adjustable headband allowed them to fit them comfortably on my head, even over glasses – one monitor for each eye.

The strange jargon the salesman was speaking made it crystal clear that I'd become seriously out of touch with developments in the world of monitors. About seven years out of touch.

Now he had my attention. The 'major manufacturer' who was beta-testing this unit might lend it to me – free – in return for my feedback about how I liked it. That seemed like a good deal; I took it home with me. I quickly discovered, however, that even this unit had some drawbacks.

It didn't take long to figure out that I would be in trouble if I tried to run a finger down the screen to locate something. When I started to do it out of habit, I succeeded only in putting my finger into my eye. And the next day, when I jumped up in the middle of doing an essay to answer the doorbell, the results were not pretty.

As usual, it was Ms Computer Writer who made the most incisive observation. She pointed out a couple of failings in me that she hadn't seen before. I'd inadvertently become less conscientious about returning phone calls; and some things seemed not to be making it onto my to-do list; I was forgetting to act on the brief notes I used to write myself. Finally, working together and simulating my work habits, I was able to see what the problem was: the tiny screens were much to small to hold the Post-It notes that used to accumulate on the right-hand side of my monitor during the day.

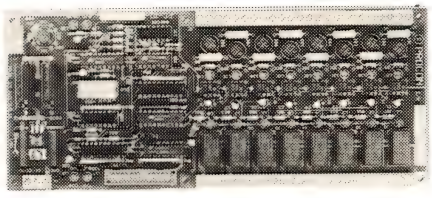
I've retrieved my old monitor from the garage and reconnected it to my computer. I can see that I'll probably have to wait another seven years before the industry makes a monitor that really meets *my* needs. □

IN ANYONE'S LANGUAGE* PROCON TECHNOLOGY LETS YOU TAKE CONTROL!

We manufacture a wide range of 'real-world' digital I/O boards. Each board features: 8 opto-isolated inputs, 8 isolated outputs (relay or solid-state AC/DC), LED indication is provided on all I/O and IBM-PC Software is included.

The system features: External mounting (up to 30 metres from computer) operating through any IBM-PC parallel printer port and capable of expanding to 240 I/O points.

Applications: Home or business security systems, process monitoring and control, laboratory automation, quality control testing, environmental control and energy management.

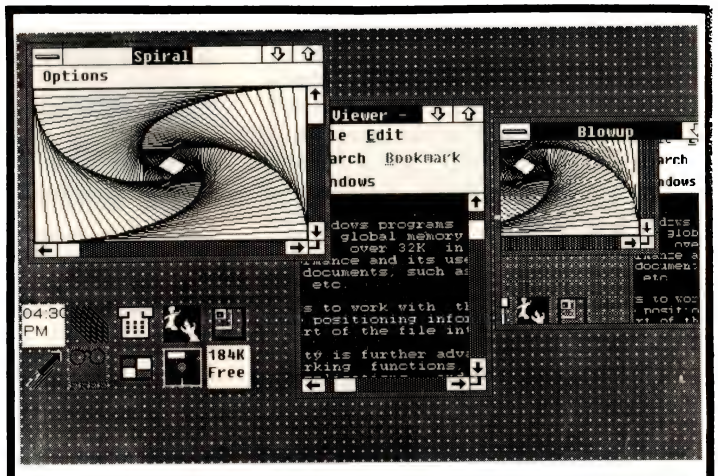


I/O board shown here: PC-IO-NR-24VAC

PROCONtechnology

P.O. Box 43, Essendon, VIC., 3040 TEL: (03) 3364956

*** Yes! High-speed drivers are provided for GWBASIC, QuickBASIC, TurboBASIC, QuickC, TurboC and TurboPascal. Our file I/O driver also allows many other programs and languages to be used. E.g. DBASE, Clipper, COBOL, FORTRAN, MODULA-2 etc.**



Windows Software

Public Domain & Shareware

A quality collection of Windows Public Domain and Shareware programs for the Microsoft Windows environment:

Command Post adds facilities to the MS-Dos executive window incl. user defined menus, prompting, windows arrange, hot key, screen blanking **Browser** view files in ascii, ansi, hex, fast searching, hide or reveal matching lines **Freemem** Icon dynamically displays free memory (*essential!*) **Firework** Windows version of Macintosh screen blanker **Blowup** capture any part of screen into clipboard (*used to create picture for this ad*) **Tiler** Arranges all active application windows into equally sized, non-overlapping windows **XVT-Draw** Full featured drawing and design, manipulate picture segments, **Easel** View and convert pictures from Paint, Pbrush, Macintosh & GIF formats **plus** Mandelbrots, 3D'o's and 'x's, Digilock, Low level disk examiner, Calpopup, Phone rolodex, Spy, Ghosts, Crumble, Printer & paginator and more...

For entire collection send cheque/money order for $40 + $5 shipping to

New Age WindowWare, 33/75 Park Rd, Middle Park Vic. 3206

Stop Spinning Your Wheels Trying To Find The Right Software Command.

The frustrations of working with software programs can make your head spin. Finding the documentation, plowing through hard-to-read manuals, fighting with templates—they all add up to lost productivity.

With WHEEL EASE,™ you don't need to keep bulky and difficult-to-read documentation at your computer station or memorize hundreds of commands for different programs. Everything you need to run your software effectively is in one place, right at your fingertips.

WHEEL EASE helps you find the appropriate keystroke command for any function in seconds—just turn the wheel, and the window tells you what key, or combination of keys, to hit.

Here's what WHEEL EASE does for you:

- displays and color codes all major software functions
- shows keystroke command(s) for each function
- saves hours of time when learning new software
- allows easy access and storage
- offers Software Guides for the most popular software packages, including: WORDSTAR,® WORDPERFECT,® LOTUS® 1-2-3,® MS-WORD,® dBASE III PLUS,™ MULTIMATE,® DISPLAYWRITE,® CROSSTALK,® MS-DOS®.. More to come!

Give Our Wheel A Spin. New WHEEL EASE.™

NOW AVAILABLE FOR THESE SOFTWARE PROBLEMS
WORDSTAR® "Professional" 4.O ● WORDSTAR ® "Original" 1.O-3.3 WORDPERFECT® 4/4.1 CROSSTALK® XV13.6 ● MS-DOS® 2.XX & 3.XX ● LOTUS 1-2-3® 1.XX ● MS-WORD® 3.1 DISPLAYWRITE 4® 1.O ● MULTIMATE® Advantage 3.6 ● dBASE III PLUS™ 1.1 (3-Wheel Set) AND MORE TO COME

To: Contact International Pty Limited
P.O. Box 298, Willoughby, NSW 2068

Please send me

— Lotus 1-2-3	$19.95 each
— WordPerfect 4.1/4.2	$19.95 each
— WordPerfect 5.0	$19.95 each
— Flight Simulator	$19.95 each
— Cross Talk	$19.95 each
— Multimate	$19.95 each
— dBase (3 Wheel Set)	$39.90
TOTAL	_____

I enclose cheque/money order for $19.95 plus $2.00 for packaging. (Overseas orders allow $5.00 for air mail). Allow 21 days for delivery.

Please debit my Bankcard, Mastercard Account (delete one).

Name on card .....

Authorised signature .....

Credit card expiry date ___/___/198___

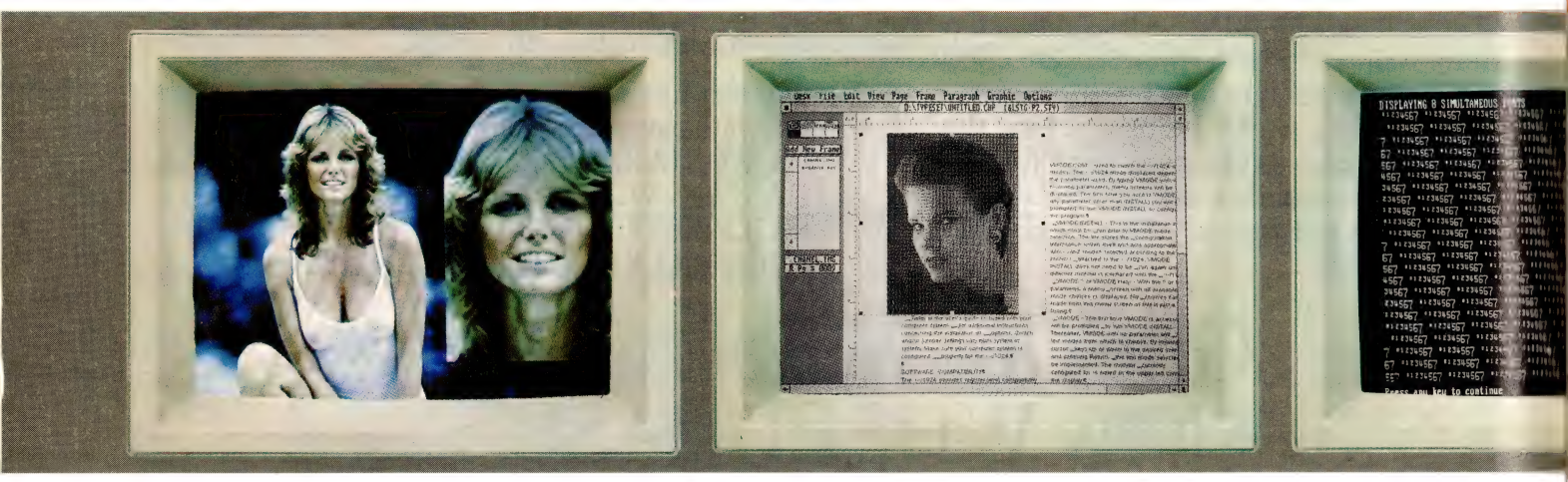
Name .....

Address .....

..... Postcode .....

Tel: (02) 407 2435. Fax order (02) 407 2151.

MONITOR



Computer graphics have been with us since 1963 when Ivan Sutherland, then studying at MIT, put together a machine which 'drew' images on a cathode ray tube. Monitors have come a long way since then. . .

OF COURSE, THE need to display information on a screen was around long before 1963, but it is unlikely that monitors would be as powerful as they are today without Sutherland's invention. Graphics quickly became the domain of mainframe, mini and eventually home computers (Tektronix, Prime, Apple and Commodore to name but a few) but PCs sold into the business market were a little slower catching on. When IBM released its PC in late 1982, it was with the MDA (Monochrome Display Adaptor) which had no graphics capabilities. Recognising a gap in the market, Hercules released its MGA (Monochrome Graphics Adaptor) card which essentially created the PC graphics market and provided a variety of features and options.

IBM responded by developing a graphics adaptor with limited colour capabilities, known as the CGA (or Colour Graphics Adaptor) card. It was at this point that users then needed to purchase not only a video card, but also a new monitor to support a new graphics standard. Then came the EGA standard (Enhanced Graphics Adaptor) which was a small step up from CGA, supporting this card's modes and also providing a slightly higher resolution which offered a fraction less power than Tecmar's alternative to CGA. Users were then faced with the decision of whether to stay with CGA or move to EGA, requiring the investment in yet another monitor.

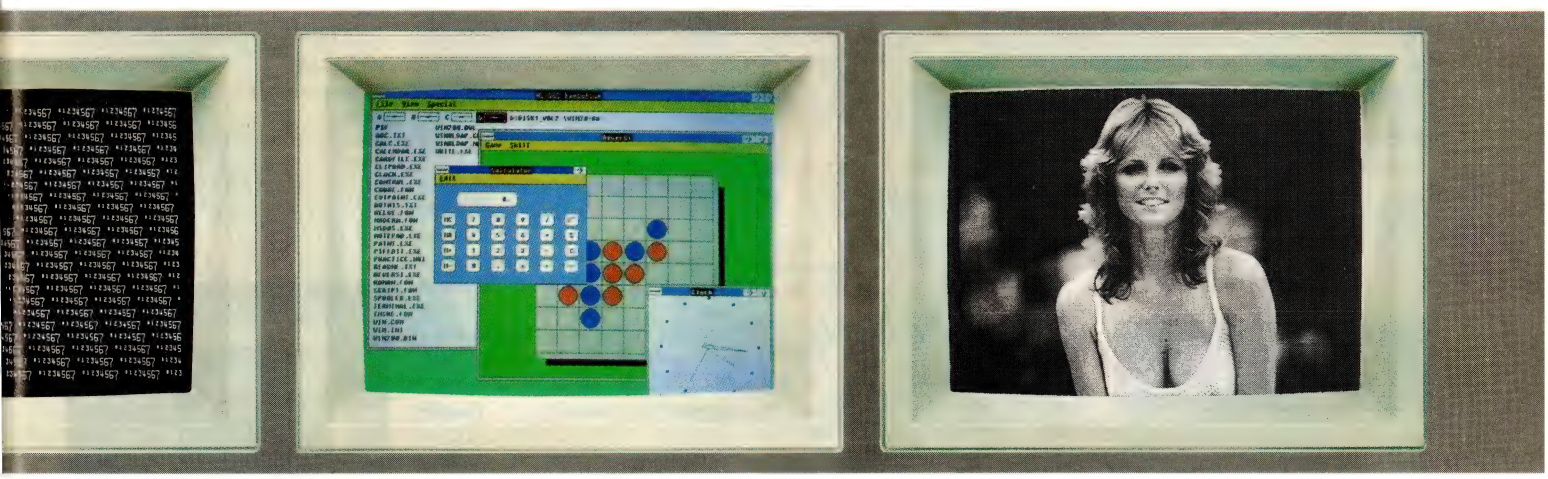
But, help was on its way. Shortly after this standard was introduced, NEC announced the first multiscanning monitor, the now famous Multisync. Multiscan monitors offered flexibility not seen before in that they supported CGA and EGA (and other standards) and, instead of switching monitors, all users needed to do was to switch modes. Needless to say, NEC did not maintain a monopoly on this technology for very long and soon other manufacturers released their own multiscan displays, although until Sony released the Multiscan 1302, still available today, few of the multiscans would make as significant an impact as the Multisync.

IBM then digressed momentarily and produced the Professional Graphics Adaptor, a relatively unknown standard which was an expensive, vector-based system designed primarily for the CAD/CAM market. Many of the Multiscan monitors available could handle PGC, but IBM's entry into this area was a little untimely, as standards were already well established in CAD/CAM and consequently the PGC quietly faded into the background. As far as monitor manufacturers were concerned, however, PGC would prove to be a godsend as it was an analog-based system.

With the introduction of the PS/2 range in 1987, IBM caused quite a commotion with the inclusion of the VGA (Video Graphics Array) system, which was the first PC standard from IBM to use analog display technology, a far more flexible technique than the previous digital (TTL – Transistor to Transistor Logic) methods. And, VGA was close enough to PGC in specifications for users to be able to use the analog port in existing multiscans.

Of course, SuperVGA is now upon us and this standard offers resolutions and colours which rival, and are, in some cases, su-

IN-SIGHT



perior to photography for definition, accuracy and clarity. And this is, in no small way, due to advances made in monitor technology. Large-screen monitors in particular, provide the higher resolution and display area necessary for serious, graphic-intensive applications such as desktop publishing or CAD/CAM. And, obviously, without a monitor able to display the images generated a SuperVGA card, there is little point in using such a card.

Further, the advent of large double-page, colour A4 screens has provided the desktop publishing market with a display system that provides true colour WYSIWYG. In other words, monitor tech-

Standards

ONE OF THE many areas in which personal computers have shown phenomenal growth is that of graphics. Of course, the ability to display pictures in colour or monochrome is nothing new. One of the first microcomputers, the Apple II, achieved its high degree of success and acceptance mainly because of its (then) advanced graphics capabilities (an all points addressable resolution less than five times that of the standard offered today).

Since then, the graphics power of PCs has steadily evolved starting with CGA and working through to PGC, EGA and, more recently, VGA and the 8514/A. Other standards also popular include: Hercules MGA and SuperVGA. With the proliferation of standards available today, readers can be forgiven for wondering just what all the different standards are, and the power and features they offer. In chronological order, they are:

□ Monochrome Display Adaptor. This adapter displayed text only, and was supplied with the original IBM PC in late 1982.

□ Hercules (Monochrome Graphics Adapter). Introduced shortly after the PC, the Hercules card was the first graphics card for the PC and offered a number of significant features including: monochrome graphics at a resolution of 720 by 348; multiple text fonts and a variety of graphics modes.

□ Colour Graphics Adaptor. The CGA card was IBM's first graphics card for the PC, and differed from the Hercules offering in that it had (limited) colour capabilities. Modes provided included: 640 by 200 in monochrome and 320 by 200 in four colours.

□ Enhanced Graphics Adaptor. EGA was IBM's next move, and was largely a response to other cards released just after CGA which offered more features. EGA supported all CGA modes as well as 640 by 350 in 16 colours.

□ Professional Graphics Controller. This system was IBM's first analog graphics controller, and died shortly after its launch, as discussed in the main article.

□ Video Graphics Array. VGA was released concurrently with the PS/2 range of microcomputers and along with supporting CGA and EGA, provided two other modes of: 640 by 480 in 16 colours and 320 by 200 in 256 colours.

□ SuperVGA. These systems support most of the modes and standards available from other systems, proprietary configurations and a new standard of: 640 by 480 in 256 colours. Many of these adaptors, such as the Video 7 VGA card, support resolutions of up to 1024 by 768 requiring large screens for optimum results.

nology has also outstripped printer technology as the efficient, convenient production of colour hard copy remains a problem which is unlikely to be solved for some years yet.

This is not to say that a high-resolution, colour, large screen monitor is vital to the success of graphic-intensive applications – the Macintosh is a good case in point. Although the original Mac display was monochrome, measured only 9 inches across diagonally, and had a resolution of only 512 by 342, this machine was more than capable of displaying text and graphics in a (near) WYSIWYG format, mainly due to its square pixels, or picture elements (it also deserves the credit for being the inspiration behind object-orientated graphics software). As our survey shows, for most users standard multiscan monitors remain a viable, cost-efficient solution to text and graphics display needs, and those users requiring only EGA graphics will probably find that TTL monitors will suffice.

However, the range of options in computer monitors has never been as large as it is today. Whilst this survey is not exhaustive, it is certainly comprehensive.

Monochrome monitors

AOC MM-211D ***$185***
VGA, EGA, CGA; flat display 230 by 180mm; reverse video. Maximum resolution 720 by 350; dot pitch 0.31mm; vertical scan of 47 to 63Hz; horizontal 15 to 18kHz. Twelve-month warranty. Micro Focus (02) 476 5944; Computer Developments (07) 352 6022.

Radius Two Page Display ***$3695***
Macintosh II and SE; 48 cm diagonal screen. Supports grey scale. Maximum resolution of 1152 by 882; horizontal scan (not specified). 12-month warranty. InfoMagic (02) 975 1044.

AOC MM-213 ***$195***
VGA; flat display 230 by 180mm. Maximum resolution 800 by 600; dot pitch 0.28mm; vertical scan of 50 to 70Hz; horizontal 31.4kHz. Twelve-month warranty. Micro Focus (02) 476 5944; Computer Developments (07) 352 6022.

Hercules; 30.5cm diag.; non-glare screen. Maximum resolution of 920 by 350; dot pitch (not specified); vertical scan of 50/60Hz; horizontal scan 18.432kHz. 24-month warranty. Philips (02) 742 8222.

14-inch (paper white) ***$250***
Hercules; 35.5cm diag.; non-glare screen. Maximum resolution of 920 by 350; dot pitch (not specified); vertical scan of 50/60Hz; horizontal scan 18.432kHz. 24-month warranty. Philips (02) 742 8222.

14-inch VGA (paper white) ***$290***
VGA; 35.5cm diag.; non-glare screen. Maximum resolution of 920 by 480; dot pitch (not specified); vertical scan of 50/60Hz; horizontal scan 31.5kHz. 24-month warranty. Philips (02) 742 8222.

MP5771 One-Page (paper white) ***$860***
Flat face display 264 by 197mm. Maximum resolution 1006 by 1048; dot pitch (not specified); vertical scan of 59.88Hz; horizontal 62.75kHz. Twelve-month warranty. Samsung Electronics (02) 638 5200.

MU9511 Dual-Page (paper white) ***$860***
Flat face display 360 by 270mm. Maximum resolution 1288 by 1024; dot pitch (not specified); vertical scan of 63Hz; horizontal 66kHz. Twelve-month warranty. Samsung Electronics (02) 638 5200.

AOC MM-411D ***$195***
CGA; flat display 230 by 180mm; reverse video. Maximum resolution 720 by 350; dot pitch 0.31mm; vertical scan of 60Hz; horizontal 15 to 18kHz. Twelve-month warranty. Micro Focus (02) 476 5944.

OMT 1201 ***$195***
CGA, Mac, 8-shade grey scale; flat display 210 by 155mm; reverse video. Maximum resolution 1000 lines; dot pitch 0.39mm; vertical scan of 47 to 63Hz; horizontal 15.7/18.4kHz. Twelve-month warranty. Eastern Micro Electronics (03) 699 3088.

DSE X2400 ***$199***
4-shade grey scale; curved display 240 by 185mm. Maximum resolution 1000 lines; vertical scan of 47 to 63Hz; horizontal 18 to 18.8kHz. Twelve-month warranty. Dick Smith Electronics (02) 888 3200.

OMT 1401 ***$225***
CGA, Mac, 8-shade grey scale; flat display 235 by 175mm; reverse video. Maximum resolution 1000 lines; dot pitch 0.39mm; vertical scan of 47 to 63Hz; horizontal 15.7/18.4kHz. Twelve-month warranty. Eastern Micro Electronics (03) 699 3088.

VM 1400 ***$332***
Grey scale; flat display 240 by 180mm; reverse video support. Maximum resolution 1000 lines; vertical scan of 47 to 63Hz; horizontal 18.432kHz. 90-day warranty. SKI Peripherals (02) 649 1222.

Teco 9503 ***$279 (ex tax)***
VGA, 64-shade grey scale; flat display 235 by 175mm; reverse video. Maximum resolution 800 by 480; dot pitch 0.29mm; vertical scan of 70Hz; horizontal 31.4kHz. Twelve-month warranty. Eastern Micro Electronics (03) 699 3088.

Thomson 450W ***$300***
CGA, 16-shade grey scale; curved display 360mm diag.; reverse video. Maximum resolution 720 by 700; vertical scan of 50 to 60Hz; horizontal 15.7/18.4kHz. 90-day warranty. Peak Pacific (02) 901 0000.

Thomson 460W ***$354***
VGA, EGA, CGA, unlimited shade grey scale; curved display 360mm diag.; reverse video. Maximum resolution 720 by 400; vertical scan of 55 to 75Hz; horizontal 31.5kHz. 90-day warranty. Peak Pacific (02) 901 0000.

EIZO 3030WL ***$537***
VGA, 256-shade grey scale; curved display 235 by 170mm; reverse video. Maximum resolution 720 by 480; vertical scan of 60 to 70Hz; horizontal

18.4kHz. Twelve-month warranty. Megavision (02) 975 1877.

HP VGA Display ***$546***
VGA, EGA, CGA, 64-shade grey scale; curved display 330 by 330mm; reverse video. Maximum resolution 640 by 480; vertical scan of 60 to 70Hz; horizontal 31.5kHz. Twelve-month warranty. Hewlett-Packard (03) 895 2895.

EIZO 4030WL ***$644***
VGA, 256-shade grey scale; curved display 240 by 170mm; reverse video. Maximum resolution 800 by 350; vertical scan of 49 to 61Hz; horizontal 18.4kHz. Twelve-month warranty. Megavision (02) 975 1877.

EIZO 4050WL ***$656***
VGA, 256-shade grey scale; curved display 240 by 170mm; reverse video. Maximum resolution 720 by 480; vertical scan of 60 to 70Hz; horizontal 31.5kHz. Twelve-month warranty. Megavision (02) 975 1877.

AOC CM-313 ***$750***
VGA, EGA, CGA; flat display 280 by 210mm; reverse video. Maximum resolution 720 by 400; dot pitch 0.31mm; vertical scan of 50 to 70Hz; horizontal 31.4kHz. Twelve-month warranty. Micro Focus (02) 476 5944; Computer Developments (07) 352 6022.

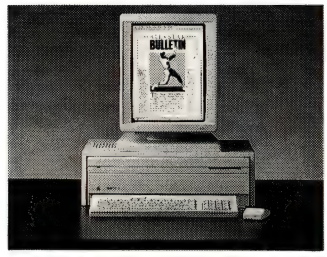
Apple High Resolution ***$772***
Mac, grey scale; flat display 255 by 310mm; reverse video. Maximum resolution 640 by 480; vertical scan of 66.7; horizontal 35kHz. Twelve-month warranty. Apple Computer (02) 452 8000.

Princeton Max-15
$775 (ex tax)
VGA, EGA, CGA, Mac, multiscan, unlimited grey scale; flat display 230 by 173mm. Maximum resolution 1024 by 768; vertical scan of 45 to 120Hz; horizontal 15 to 36kHz. 90-day warranty. Intelligent Systems (03) 583 0666.

Genius ***$1600 (ex tax)***
VGA, Mac, grey scale; curved display 210 by 280mm; reverse video. Maximum resolution 1280 by 1024; dot pitch 0.25mm; vertical scan of 63Hz; horizontal 66kHz. 90-day warranty. Datatel (03) 690 4000.

Taxan 770+ ***$1999***
VGA, EGA, CGA, Mac, multiscan; curved display 280 by 210mm; reverse video. Maximum resolution 800 by 400; dot pitch 0.31mm; vertical scan of 50 to 90Hz; horizontal 15 to 34kHz. Twelve-month warranty. Tech Pacific (02) 662 4122.

Radius Full Page Display
$2295
MacPlus and SE; 38 cm diagonal



screen. Maximum resolution of 640 by 864 (virtual 1024 by 864); vertical scan 69Hz, horizontal scan (not specified). 12-month warranty. InfoMagic (02) 975 1044.

Cornerstone Single ***$2350***
VGA, EGA, CGA, multiscan, 4-shade grey scale; flat display 300 by 220mm. Maximum resolution 768 by 1008; dot pitch 0.28mm; horizontal scan 62.7kHz. Twelve-month warranty. Micro Focus (02) 476 5944.

EIZO 6500 ***$3738***
VGA, Mac, multiscan, 256-shade grey scale; flat display 390 by 280mm; reverse video. Maximum resolution 1664 by 1200; vertical scan of 60 to 80Hz; horizontal 31.5/64 to 78kHz. Six-month warranty. Megavision (02) 975 1877.

Big Picture ***$4377 (ex tax)***
Mac; curved display 298 by 235mm. Maximum resolution 1024 by 808; vertical scan of 60Hz; horizontal 50.5kHz. Twelve-month warranty. PICA (03) 370 3566.

Cornerstone Dual ***$5275***
VGA, EGA, CGA, multiscan, 4-shade grey scale (16-shade grey scale $5600); flat display 360 by 280mm. Maximum resolution 1600 by 1280; dot pitch 0.28mm; horizontal scan 879kHz. Twelve-month warranty. Micro Focus (02) 476 5944.

Viking 1 ***from $6038***
VGA (Mac II $5463); curved display 279 by 356mm. Maximum resolution 1280 by 960; vertical scan 66Hz; horizontal 66kHz. Six-month warranty. Various options including MCA. Megavision (02) 975 1877.

Sigma LaserView ***$6150***
Mac, 4-shade grey scale; curved display 340 by 265mm. Maximum resolution 1664 by 1200; vertical scan 60Hz; horizontal 75kHz. Twelve-month warranty. Computhink (03) 584 3188.

Big Picture IQ ***$6745 (ex tax)***
Mac, 256-shade grey scale; curved display 298 by 235mm. Maximum resolution 1024 by 808; vertical scan of 60Hz; horizontal 50.5kHz. Twelve-month warranty. PICA (03) 370 3566.

Big Picture C20 ***$8455 (ex tax)***
Mac, 256-shade grey scale; curved display 340 by 270mm. Maximum resolution 1024 by 808; vertical scan of 72Hz; horizontal 61kHz. Twelve-month warranty. PICA (03) 370 3566.

Wyse WY550 ***POA***
VGA, EGA, CGA, 64-shade grey scale; flat display 238 by 176mm; reverse video. Maximum resolution 640 by 480; dot pitch 0.37mm; vertical scan of 50 to 70Hz; horizontal 31.4kHz. Twelve-month warranty. MPA (03) 894 1500.

Wyse WY700 ***POA***
EGA, CGA, 4-shade grey scale; flat display 385 by 229mm; reverse video. Maximum resolution 1280 by 800; dot pitch 0.24mm; vertical scan of 76Hz; horizontal 32kHz. Twelve-month warranty. MPA (03) 894 1500.

High-resolution monitors

CK4656 ***$415***
CGA; 35.5cm diag.; non-glare screen. Maximum resolution of 640 by 200; dot pitch (not specified); vertical scan (not specified); horizontal scan (not specified). Twelve-month warranty. Samsung Electronics (02) 638 5200.

14-inch CGA ***$580***
CGA; 35.5cm diag.; non-glare screen. Maximum resolution of 600 by 285; dot pitch of 0.42mm; vertical scan of 50/60Hz; horizontal scan of 15.6kHz. 24-month warranty. Philips (02) 742 8222.

14-inch EGA ***$850***
EGA; 35.5cm diag.; non-glare screen. Maximum resolution of 640 by 350; dot pitch of 0.31mm; vertical scan of 50/60Hz; horizontal scan of 15.6kHz to 22kHz. 24-month warranty. Philips (02) 742 8222.

14-inch VGA ***$880***
VGA; 35.5cm diag.; non-glare screen. Maximum resolution of 640 by 480; dot pitch of 0.31mm; vertical scan of 60/70Hz; horizontal scan of 31.5kHz. 24-month warranty. Philips (02) 742 8222.

AOC CM-313 ***$725***
VGA; 35.5cm diag.; non-glare, 90-degree deflection screen. Maximum resolution of 720 by 400; dot pitch 0.31mm; short persistence; vertical scan of 50 to 70Hz; horizontal 31.4kHz. Twelve-month warranty. Micro Focus (02) 476 5944.

AOC CM-314 ***$795***
VGA, EGA, PGC, MGA; 35.5cm diag.; non-glare, 90-degree deflection screen. Maximum resolution of 800 by 600; dot pitch 0.31mm; short persistence; vertical scan of 50 to 90Hz; horizontal 15 to 36kHz. Twelve-month warranty. Micro Focus (02) 476 5944.

CJ4681 ***$900***
VGA; 35.5cm diag.; non-glare screen. Maximum resolution of 720 by 400; dot pitch 0.31mm; vertical scan frequency 60/70Hz; horizontal scan 31.5kHz. Twelve-month warranty. Samsung Electronics (02) 638 5200.

Mitsubishi FA3425 ***$1550***
VGA, EGA, CGA, PGC, Mac II; 34cm diag.; high-contrast. Maximum resolution of 1024 by 780; dot pitch 0.28mm; long persistence; vertical scan of 50 to 87Hz; horizontal 15.7 to 35.5Hz. Twelve-month warranty. Mitsubishi Electric (02) 888 5777.

EIZO 9060S ***$1695***
VGA, EGA, CGA, PGC, MGA, 8514; 35.5cm diag.; anti-reflective screen. Maximum resolution of 1024 by 768; dot pitch 0.28mm; medium persistence; vertical scan of 50 to 90Hz; horizontal 15.5 to 38kHz. Twelve-month warranty. Megavision (02) 975 1877.

Seiko CM 1430 ***$1850***
VGA, EGA, 8514; 33.3cm diag. Maximum resolution of 1024 by 768; dot pitch 0.26mm; B22 phosphor; vertical scan of 43.5 to 70Hz; horizontal 31.5 to 35.5Hz. Three-month warranty. Mitsubishi Electric (02) 888 5777.

EIZO 9070S ***$2395***
VGA, EGA, CGA, PGC, MGA, 8514; 40cm diag.; anti-reflective screen. Maximum resolution of 1280 by 800; dot pitch 0.28mm; medium persistence; vertical scan of 50 to 80Hz; horizontal 20

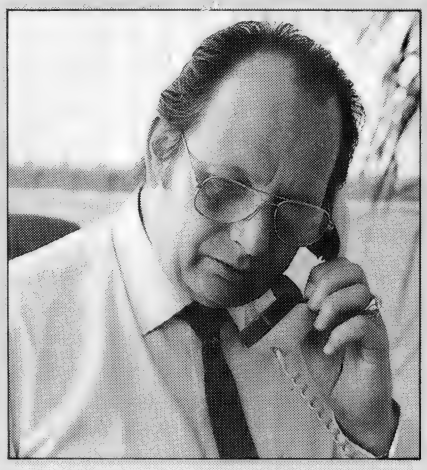
A user's market

IF THE AUSTRALIAN computing industry ever gave an award similar to the Oscars, they would do well to name it after Rudi Hoess. Years ago he brought the first Apple computers to Australia, and along the way, was an early employer of some of the industry's major players. His current company, Sydney-based MegaVision, started selling monitors in 1984, and since then has taken on a line of high-quality screens and scanners, and the software to drive them.

What excites you right now?
What excites me is participating in the evolution of bringing a technology that was once proprietary onto a common, accessible level for the typical user.

What's happening in our industry is really a progression of what's happened over the last twenty years. Proprietary technology is giving way to that capability on general platform technology, such as Apples or PCs. What we have found over the last couple of years in printing, is that desktop publishing afforded a capability in-house known as pre-press – principally and initially, typesetting – which in the past was given out to specialists.

Of course, handling just text isn't publishing. Publishing is supporting information, making it authoritative. To do so, you need a diversity of information as composite output on your paper. In other words, images, grey-level images, line art, graphics, or whatever – all of that needs to be composedon one page. Since not every potential publisher is also a graphics artist, we have to adopt a methodology. That means, essentially, pilfering existing information. And how do you get in? You scan it. So, the scanner becomes a focal point for defining, capturing, redressing, changing, and modifying information be that any form of graphics that already exists, or be it, in a creative moment, your own graphics, or text that is read using OCR [optical character recognition]. The publisher today has tools which in the past were captive and proprietary technology. And to progressively introduce these, to make those who need to publish increasingly independent from outside services, is essentially what [the business] is all about.



MegaVision is an Australian company that has become almost synonymous with monitors and practical, leading edge technology. Andrew Einspruch spoke with Managing Director Rudi Hoess on what the future holds for users. . .

What changes are we seeing in scanners, besides the obvious increase in quality of resolution?
Scanners, along with fax machines, which are really just another form of image scanning, are considered to be the fastest growth sector of image capturing, increasingly an integral tool to publishing. We anticipate that where scanners were bought in the past in an almost playful manner, or for playful use, they are becoming an important business tool. Corporations which would not have allowed their staff to play around with scanners, are now experimenting with OCR, with image scanning, and with output quality considerations of the scanned image.

Now, add to this the growing ability of grey-level, or continuous tone, scanning, and with it , of course, colour scanning. All are moving rapidly, to where today we can capture images with scanners and reproduce them on relatively stock-standard machines at a level of fidelity and accuracy where most people are still astounded.

So what changes will we see?
Scanners, like all other things, are memory hungry. That means, the bigger your program, the more memory; the more accurate your scanned image; the more information you have to shovel in your machine to reflect this for output and display. We'll see faster machines with more memory, allowing us to do sharper images, which are in turn memory hungry. So we'll need enormous cpu speeds, disk access speeds, disk caching, and disk sizes, be they the current magnetic disks or the emerging read-write optical disks. The whole graphics environment is moving to where the screen becomes essentially the medium in the first instance, and the paper reproduction is almost secondary, in as much as the fidelity first has to be placed on the screen.

So that's how the monitors fit in?
Yes, monitors fit in because we need accuracy and and fidelity. The higher the fidelity, the less proofing work is required, and the faster the final output can be delivered. If I work on a high-resolution monitor, then the final output can be higher quality earlier, and I have more confidence that, in fact, I have a better quality product when I'm finished.

What advice are you giving people these days?
My advice, where image quality is de-

to 50kHz. Twelve-month warranty. Megavision (02) 975 1877

Sampo KDS-1984 $2690
VGA, EGA, 8514; 42cm diag. Maximum resolution of 1024 by 780; dot pitch 0.28mm; long persistence; vertical scan of 43.5 to 70Hz; horizontal 31.5 to 35.5Hz. Three-month warranty. TCG Group (02) 699 8300.

Mitsubishi HL6615 $3000 (ex tax)
VGA, PGC, Mac II; 40cm diag.; high-contrast. Maximum resolution of 1280 by 1024; dot pitch 0.28/0.31mm; medium persistence; vertical scan of 50 to 90Hz; horizontal 30 to 64Hz. Twelve-month warranty. Mitsubishi Electric (02) 888 5777.

EIZO 6500 $3250
VGA, CGA, 8514; 53cm diag.; anti-reflective screen. Maximum resolution of 1600 by 1280; dot pitch 0.31mm; medium persistence; vertical scan of 55 to 80Hz; horizontal 15.5 to 38kHz. Six-month warranty. Megavision (02) 975 1877.

Taxan KX-1901 $4200 (ex tax)
CGA; 44.5cm diag. Maximum resolution of 1280 by 800; colour multi-scan; short persistence; vertical scan of 63.7; horizontal 63.6. Three-month warranty. TCG Group (02) 699 8300.

Cadvision CPD-2030 $4620
High-resolution monitor; 44cm diag.; interlaced screen. Maxi-

manded by the end user, is to consider colour scanning as a likely 'ought to have to today, should have tomorrow, must have the day after'. As an industry, we're very excited about the ability to do colour scanning, producing life-like images on the screen which startle people at exhibitions and excite advertising agents as possible immediate users. But, we need to merge practical considerations and uses with exciting uses to be commercially viable. We need to use the high-quality capturing capability of a colour scanner for black and white work as well, which is typically OCR and desktop publishing. Once we can capture images of up to 16 million colours, if you have the memory and the speed to display such information, it is then necessary to deliver such images for paper reproduction, which means colour separation. Colour separation will shortly be just another level of output of the very computer that captured the image in the first place.

So what do you find frustrating?
The weeks are too short. Actually, frustrations occur when you're trying to run faster than people can switch lights on for you. In principle, we're dealing with a very conservative industry, the printing industry. And, we're dealing with a relatively conservative user, because they've been burned by promises over the years. Also, we're dealing with a reluctance of the vendors to sell anything more than vanilla-flavoured information, because that's about as much as they know.

What is essentially happening is that a form of reselling – selling computing systems, or rather, 'nouveau applications,' if you wish – is almost end user pulled, rather than industry pushed. We have restructured the way things are sold, and the way people are educated about what they can do. The traditional grocery shop 'put it on the shelf somebody will buy it' approach simply no longer applies. No doubt, the ultimate benefit to all of us will be that professionalism may once again be a mandatory requirement in our industry.

You once said, 'We don't hate mainframes, we love them. They make the best peripherals.' How does that statement stand now?
If anything, it is more appropriate. People are obviously not stopping their mainframe use. Mainframes were originally installed for centralised work, and they had to be big to cater to the enormity of the work given to them. No one individual has ever required the volume of work that a mainframe could digest. However, we need the ability to access it, be it a graphic or CAD database, we lust information, and mix and merge this information with our own, and presumably pass it on for better use.

So the information depositories will always be mainframes, only their use will be different – they'll be more like libraries, rather than dictators of what we can use. That, of course, is not new. It's just happening in more and more areas, where we find the knowledge base is the criteria of our existence, rather than skills. We are driven by knowledge. The argument that knowledge is power is truer now than ever, since almost all the industries we have are more information-bound than they are skill-bound.

Do you use computers in your personal life?
Yes and no. No, I don't sit at night over computers and pump away until my fingers are sore or my contact lenses fall out. I use them, yes, but in a conceptual way, because I want to establish proof that they can be used the way I expect them to be used, and that even I can use them. So they're used in an exploratory fashion, and while we use computers all over the company, in every facet, I don't find them attractive enough at this point to have one on my desk.

What's the most important growth segment facing the industry right now?
There is no doubt in our minds that it is the area we are in, namely, displaying information in whatever is the most meaningful form, recreating it so it can be passed on, be it on fax, paper, or from screen to screen, and to make this information as honest and recognisable as possible. This is so those who are not used to computers, or have no prior experience, can recognise the message, instead of wondering what they're being told, and take the necessary steps, acting on what the message implies.

The growth has to be the area of displays, more and more displays, and larger displays. The trend is quite visible today (pun intended). And, growth will also be in image management, where computers are used more and more for end user-related functionality, such as the Windows and the Presentation Manager environments, and the like, which is really not a computing skill any more, but purely a means of making the information palatable to the relatively low-skilled user. Maybe we'll reach the point where the user doesn't have to be computer wise, because the information is presented in such a way that they understand it anyway.

Is there a technology that you are looking forward to having available?
Plenty of speed, plenty of memory, and multi-tasking. All of which means we may run out of the linear evolution of the 6800s and the 80x86 series. We have to look at transputers and multiples thereof, to cater to the complexity of the task we have to deal with at at an end user level. Machine power has to be brought to the user to deliver that capability, whereas the mainframes in the back won't necessarily change that much, because their demand cycle will be, if anything, lower rather than higher.

So where's the opportunity?
The opportunity is at end user level. As we extend the users of computers outside the traditional application fields, which we do almost daily, we find that the end user is the knowledge party, who is, at best, handicapped by the selling party. The user knows what is expected, and what is right and wrong.

mum resolution of 1024 by 768; dot pitch 0.31mm; B22 phosphor; vertical scan of 60Hz; horizontal 48kHz. Three-month warranty. TCG Group (02) 699 8300.

Cadvision CPD-2040 $4900
High-resolution monitor; 44cm diag. Maximum resolution of 1280 by 1024; dot pitch 0.31mm; B22 phosphor; vertical scan of 60Hz; horizontal 64kHz. Three-month warranty. TCG Group (02) 699 8300.

Mitsubishi HA3905 $5537
VGA, EGA, CGA, PGC, Mac II; 34cm diag.; high-contrast. Maximum resolution of 1024 by 874; dot pitch 0.31mm; long persistence; vertical scan of 50 to 87Hz; horizontal 15.7 to 35.5Hz. Twelve-month warranty. Mitsubishi Electric (02) 888 5777.

EIZO 9500 $6950
VGA, CGA, 8514; 51cm diag.; anti-reflective screen. Maximum resolution of 1280 by 1024; dot pitch 0.31mm; medium persistence; vertical scan of 55 to 75Hz; horizontal 31.5 to 78kHz. Six-month warranty. Megavision (02) 975 1877.

Multiscan monitors

CM4531 EGA Color Monitor $735
EGA, CGA; 35.5cm diag.; non

Monitor mechanics

Inside monitors brought into focus by Mark Cheeseman . . .

COMPUTERS HAVEN'T always used video monitors as their main visual output device. Teletype terminals (essentially similar to telex machines) provided a means of both input and output, and in the rather frequent occurrence of a system crash, a hard copy of what led up to the crash, and also any data which may have otherwise been lost, was there on paper. Of course, the use of these machines resulted in the wastage of a lot of paper, and they were noisy and rather slow, running as they usually did at 110 baud. This led to the 'glass teletype,' which used an ordinary TV video monitor to display the output from the computer. They were much faster, operating at up to 9600 baud, and sometimes even faster, and didn't waste our dwindling supply of trees.

It soon became evident that even greater performance could be obtained if the computer directly controlled the screen itself, rather than sending all the information to an external terminal over a serial link. Bit-mapped graphics became possible, and as display technology improved, and memory prices dropped, the demand grew for displays of ever-increasing resolution. Any computer display system consists of two major components: the monitor itself, and the display controller. The latter may be part of the main board of the computer, as is the case with the IBM PS/2 range and the small footprint Macs, or it can be on a separate card, as in the XT and AT machines and the Mac II. Obviously the second option allows more flexibility then the former in selecting an appropriate display for the intended application.

The operation of monochrome and colour monitors is quite similar in all respects except that with colour there are three colours to be displayed simultaneously instead of one, so for simplicity's sake, we'll look at monochrome first.

Monochrome

THE MOST VISIBLE component of a monitor is obviously the picture tube (or cathode ray tube) itself. The screen is coated on the inside with a phosphorescent substance, which emits light when struck by high-speed electrons. These electrons are emitted from an electron gun at the rear end of the tube, and are modulated to vary the brightness as perceived from the front of the screen.

On a monochrome screen displaying basic text or graphics, the electron beam is either on or off, resulting in an image with no grey levels. To obtain grey levels, the beam is accelerated at varying rates, resulting in intermediate levels of brightness from the phosphor on screen. A colour monitor has three such electron guns, one for each primary colour – red, green and blue. When the electrons hit the phosphor coating on the screen, the kinetic energy possessed by the electrons is converted to light energy. The actual colour of the light emitted depends on the composition of the phosphor, and is usually white for a monochrome screen, or red, green and blue for a colour monitor.

So far, this only results in a single dot in the middle of the screen, which may be either bright or dark, or somewhere in-between. Of course, a complete screen image is made up of an array of such dots, and in order for the electron beam to 'illuminate' all of these dots, it is swept past them in sequence, while being turned on or off, according to whether that particular pixel is required to be on or off (or in-between). To move the electron beam around the screen, a magnetic field is applied to the stream of electrons, which causes them to be deflected in one direction or the other due to their inherent electric charge. This magnetic field is generated by two pairs of coils placed around the neck of the tube – one pair sweeps the beam in a horizontal direction, while the other pair causes vertical deflection.

By applying appropriate signals to these coils, the electron beam is swept across the screen in a series of horizontal lines, each starting from the left-hand edge of the display area, and ending at the right-hand side. While the beam is traversing one of these lines, the circuitry in the video controller turns the beam on and off, according to whether a dot (or pixel) is to be displayed at that point on the screen on not. The maximum rate at which the electron gun can be turned off is known as the bandwidth of the monitor, and basically determines the horizontal resolution. The higher the bandwidth, the more discrete dots can be displayed in the space of one horizontal line.

When one complete line has been sent to the monitor, the electron beam is turned off, and a horizontal synchronisation (sync) pulse from the display controller causes the electron beam in the monitor to 'retrace', or move back to the beginning of the next line on the screen. This process is repeated for each line on the screen until the bottom edge of the screen is reached, whereupon the beam is turned off again, and a vertical sync pulse sends the beam back to the top left-hand corner of the screen, ready for the next screenful (or frame) of information.

The number of horizontal sync pulses per second (which is approximately the same as the number of lines displayed in one second), is called the horizontal sync rate, or line rate and is of the order of tens of thousands of lines per second. The number of frames per second is called (naturally enough) the frame rate or vertical sync rate, and is usually between 50 and 70 frames per second.

There is one exception to this generalisation, and that applies to interlaced displays, which allows an increase in the resolution of a monitor without a corresponding increase in the bandwidth. This is achieved by displaying each frame of the image as two separate fields, each containing half of the information on the image. One field consists of the odd-numbered lines of the image, and the other the even-numbered lines. These two frames are displayed alternately to build-up the complete image in two separate operations.

If the rate at which these fields are displayed is (say) 50 fields per second, then only 25 complete images are displayed per second. So, compared with a non-interlaced monitor of the same resolution, the same amount of information is being displayed at half the rate, so that the interlaced monitor only needs to have half the bandwidth of its non-interlaced counterpart. The downside is that, unless the phosphor on the screen is reasonably persistent (that is, it glows for some time after the electron beam has passed it), the screen will have a noticeable flicker. Ordinary television images are interlaced, as is highest resolution mode on the Amiga (for compatibility with TV images). The IBM high-resolution 8514 display system also uses an interlaced display.

The rate at which the electron beam is swept across the screen, both vertically and horizontally, is determined entirely within the monitor itself: the display controller has no control over these sweep rates, it merely tells the monitor when to begin a new line or frame. Therefore, it is important to ensure that the monitor's beam sweeps across the screen at the correct rate, so that the beam has reached the right-hand side of the screen when the last pixel on that line is sent down the cable to the monitor. Similarly, the electron beam should be at the bottom of the screen when the last line of pixels is being displayed.

Because the vertical and horizontal resolution of the large range of displays are all different (otherwise, why have so many systems

in the first place?), a monitor designed for use with one system cannot, as a rule, be used with a different one. However, a number of monitors are available which sense the line and frame rate and automatically adjust to fit the image on the screen. The NEC Multisync was the first of these.

So far, we have only really looked at a monochrome system. The red, green and blue colours used in colour monitors (and colour television sets) allow quite a wide range of colours to be displayed by mixing them in different proportions on the screen.

Colour

THE PHOSPHOR DOTS on the screen are usually arranged in a triangular array, called a triad, each consisting of one red, one green and one blue dot. Each pixel on a colour screen is in fact one of these triads of coloured dots. Sony Trinitron monitors (and TVs) have three vertical stripes, arranged side-by-side instead of a triad of dots. A special mesh behind the screen, called a shadow mask, ensures that each of the three different coloured phosphors is only 'illuminated' by the appropriate electron gun, and is shielded from the other two.

In order to accurately reproduce colour images on the screen, the three beams must always be pointing to the same point at the same time. If this is not the case, the display is said to be mis-converged, with the different colour components of the image displaced vertically, horizontally, or both. Two other forms of distortion which can occur on both colour and monochrome systems are pin-cushion or barrel distortion. Pin-cushion distortion arises because the corners of the display are further away from the electron gun than the centers of the edges of the image. Thus, the electron beam(s) do not need to be deflected through as great an angle.

A pin-cushion correction circuit is built into the monitor to compensate for this effect. However, if this circuit is ineffective (or not correctly adjusted), the sides of the image will appear to bend inwards, giving rise to so-called pin-cushion distortion. If the circuit over-compensates, then the sides will bend outwards, giving the appearance of a barrel.

Analog and digital

ANOTHER WAY IN which display systems can be grouped is their use of analog or digital signals between the display controller and monitor. Digital signals have the advantage of being less prone to crosstalk (mutual interference between the various signals in the cable) and other forms of interference than analog ones. However, digital signals can only be either on or off, and not anywhere in-between, so that a single signal wire can only turn an electron gun on or off. Two wires per gun would give four levels of intensity, and 18 signal wires (six per gun) would be required to display the 256K colours that the VGA is capable of.

Analog signals, on the other hand, can assume any voltage level between a pre-determined minimum and maximum, allowing an unlimited range of intensities to be displayed by each gun (although this does not mean that any arbitrary colour can be displayed, although the actual range available is more than adequate for most applications). These signals are of course still derived from a digital source (the video RAM in the controller), but are converted to analog form on-board rather that in the monitor, which is inherently an analog device regardless of the capabilities of the graphics adaptor.

The vertical and horizontal resolution specifications have been mentioned already, in relation to scan rates and bandwidth. Clearly, the greater the resolution of the monitor and associated controller, the more detail can be shown on the screen. However, the ratio of horizontal to vertical resolution is also important if images displayed on the screen are to appear undistorted. A typical monitor screen is three-quarters as high as it is wide. This ratio of frontal dimensions is the aspect ratio of the screen, which in this case is 4:3. Each individual pixel also has an aspect ratio, and it is usually desirable in graphics-based applications for this ratio to be 1:1, as this is the ratio of dots on most printers and step increments on plotters.

It follows from this that there should be one third again as many dots across the screen as there are down. The Macintosh has always had so-called 'square' dots, owing to the heavy graphics emphasis from the outset with this machine. However, of the various IBM adaptors available for its old PC range, none had this aspect ratio. It is only with the VGA adaptor, with its maximum resolution of 640 by 480 that PC users have had a screen which would not make circles appear as ellipses. The so-called 'Super-VGA' mode (800 by 600) and even higher resolutions such as 1024 by 768 also meet this requirement. It is for this reason, more than any other, that the VGA is rapidly gaining acceptance as the 'entry-level' graphics subsystem for serious CAD and desktop publishing applications.

glare screen. Maximum resolution of 640 by 350; dot pitch of 0.31mm; horizontal scan of 15.75 to 21.85kHz. Twelve-month warranty. Samsung Electronics (02) 638 5200.

Compaq dual mode $481, adaptor $341
CGA, Hercules; 30cm diag.; green or amber etched screen. Maximum resolution of 720 by 350; dot pitch (not specified); horizontal scan of 15.8 to 18.5kHz. Twelve-month warranty. CCA Systems (02) 660 0077.

ADI DM2214 $863
EGA, CGA; 35.5cm diag.; dark glass screen. Maximum resolution of 720 by 350; dot pitch 0.31mm; horizontal scan of 15-.7kHz to 22.0kHz. Twelve-month warranty. Imagineering (02) 697 8666.

Princeton Graphics Systems HX-12E $876
EGA, CGA; Hercules; 30.5cm diag.; tinted, non-glare, etched screen. Maximum resolution of 770 by 350; dot pitch 0.28mm; horizontal scan of 15.7 to 21-.8kHz. 3-month warranty. Intelligent Systems (03) 543 7988.

ADI DM3114 $919
VGA, EGA, CGA, Hercules; 35.5cm diag.; dark glass, non-glare screen. Maximum resolution of 720 by 480; dot pitch 0.31mm; horizontal scan of 31-.4kHz. Twelve-month warranty. Imagineering (02) 697 8666.

CT4581 Sync-Master $950
SuperVGA, VGA, MCGA, PGC, EGA, CGA, Hercules, Macintosh II; 35.5cm diag.; non glare screen. Maximum resolution of 800 by 600; dot pitch of 0.31mm; horizontal scan of 15.38kHz. Twelve-month warranty. Samsung Electronics (02) 638 5200.

NEC JC-1402HMR, Multisync II $999
VGA, EGA, CGA, Hercules, Macintosh II; 34cm diag.; direct etched screen. Maximum resolution of 800 by 560; dot pitch 0.31mm; horizontal scan of 15.5 to 35-.0kHz. Twelve-month warranty. NEC Home Electronics (02) 868 1811.

Forefront ECM 5400 $1002
EGA, CGA; 30cm diag.; etched screen. Maximum resolution of 640 by 350; dot pitch 0.31mm; horizontal scan of 15.7 to 21-.8kHz. Twelve-month warranty. SKI Peripherals (02) 649 1222.

Evervision 200 EGA $1037
EGA, CGA; MGA; 36cm diag.; 90 degree deflection, dark tint, 57 percent non-glare screen. Maxi-

MICROLAND

AUSTRALIA'S No. 1

AUSTRALIA'S NO. 1
WILL NOT BE BEATEN
ON PRICES AND SERVICE
THIS MONTH.
PLEASE CALL FOR
PRODUCTS NOT LISTED.

THIS IS YOUR MONTH FOR SAVING CALL AND WE WILL PROVE IT.

SOFTWARE

WP

Multimate Adv	CALL
WordPerfect V5.0	$550
MS Word V5.0	$475
XYWrite	$495
Wordstar 2000 + V3.0	$390
Wordstar PRO V5.0	$375
Lotus Manuscript	CALL
Sprint	$245
AMI	$295

MICROSOFT

Excel	$555	Fortran Compiler	$555
Multiplan	$195	C Compiler	$555
Word V 5.0	$475	Quick Basic	$ 97
Project	$410	Quick C	$ 97
Works	$195	Macro Assembler	$185
Windows 286	$125	Flight SIM V3.0	$ 75
Mouse	$180	Learning DOS	$ 75

DATABASE

dBase IV	$860	Q&A	$445
dBase III Plus	CALL	Foxbase	$550
db XL V1.28	$265	rBase	$895
Paradox V3.0	$735	Clipper	$750
Quick Sliver	$670		

LOTUS

Lotus 123
Lotus Hal
Symphony V2.0
Freelance Plus V3.0
Manuscript
Graphwriter II
Agenda

CALL FOR BEST BEST PRICES IN AUSTRALIA DON'T BE A LOSER

PROJECT

Timeline V3.0	$735
Harvard Proj MGR III	$845
MS Project	$410
Grandview	$330
TimeLine V2.0	$495

INTEGRATED

Framework III	$795
Ability Plus	$240
Symphony V2.0	$CALL
First Choice V3.0	$195
Smart System	$CALL
MS Works	$195
Open Access II Plus	$995

GRAPHICS

Design CAD 3D&2D	$450
Harvard Graphics	$485
Autosketch	$175
Autosketch Enhanced V2.0	$210
Inset	$195
Freelance Plus V3.0	CALL
Xerox Ventura V2.0	CALL
Aldus Pagemaker V3.0	CALL
Design CAD 2D	$450
Design CAD 3D	$450

ACCOUNTING

DANT Accounting	$995
SBT Single User	CALL
DAC Easy	$295
Attache 4	$725
Attache Modules	CALL
Bedford (Instead of In House Accountant)	$749

BORLAND

Turbo Pascal V5.5	$169	Developers Library	$425
Turbo C V2.0	$155	Sidekick Plus	$245
Turbo Basic	$149	Sprint	$245
Turbo Prolog	$135	Mace utilities V5.0	$138
Turbo Pascal Pro Pak	$295	Mace Utilities Gold	$198
Turbo Assembler/Debugger	$165	Fastback plus	$205
Turbo C Pro Pak	$295		

COMMS

Laplink	$160	Crosstalk	$199
Mirror III	$155	Smarterm 240	$460
Softerm PC	$CALL	Smarterm 220	$275
SuperCom V3.0			$149
Carbon Copy Plus			$245
PC Anywhere			$185
Desklink			$190

SPC

Harvard Graphics	$485
Harvard Proj MGR III	$845
Office Writer	$470
1st Choice V3.0	$190
1st Graphics	$190
1st Publisher	$160
P.F.S. Write	$219
P.F.S. File	$350
P.F.S. Plan	$170

UTILITIES

PC Allen	$ 89	Bookmark	$195
Smartkey	$ 89	Mace Utilities V5.0	$138
XTree	$ 98	Mace Utilities Gold	$198
XTree Pro	$155	Print Q	$125
PC Tools Deluxe	$115	Sideways	$ 95
Take Charge	$160	Printworks	$135
Norton Utilities	$110	Typequick	$ 85
Norton Advanced	$157	Disk Technician	$165
Norton Editor	$ 99	Disk Technician Plus	$195
Norton Guides	$115	Formtool	$189
Norton Commander II	$99	Fastback Plus	$205
101 Macros	$105	Pathminder Secure	$125

DIGITAL RES

Gem Draw Plus	$335
Gem Graph	$335
Gem Wordchart	$245
Gem Artline	$595
Gem Presentation Team	$535
Gem Desktop Publisher	$535

HARDWARE

AUSTRALIA'S NO. 1 SALES AND SERVICE

PRINTERS

EPSON

LX800 ..... $369
LQ500 ..... $565

FX850 SQ850
FX1050 SQ2550
EX800 LQ2550 +
EX1000 LQ2550
LQ860 GQ3500
LQ1060 TLQ4800

CALL FOR AUSTRALIA'S BEST PRICES DON'T BE A LOSER

GT4000 COLOUR SCANNER
TSQ 4800
DFX5000

TOSHIBA

Express Writer 311	$AVE
P341SL	$AVE
EXPRESS WRITER 301	$AVE
P321SL	$AVE
P321SLC	$AVE
P351SX	$AVE
Pagelaser 12	$AVE

CALL FOR AUSTRALIA'S BEST PRICES

FUJITSU

DX2300	$ 749
DX2400	$ 975
DL2400	$1349
DL2600	$1795
DL3300	$1049
DL3400	$1195
DL5600	$3295

LIMITED STOCKS! HURRY!

Brother M1709	$ 825
Brother M1724	$1160
Microline ML390	$1079
Microline ML391	$1349
NEC P5200	$ 920
NEC P5300	$1395
HP DESKJET	$CALL
DICONIX PORTABLE	$ 815

HARD DISKS

Seagate 20Mb + Cont	$ 495
Seagate 30Mb + Cont	$ 515
Miniscribe 20Mb	$ 410
Miniscribe 30Mb + Cont	$ 525
Miniscribe 40Mb	$ 510
Control Data 40Mb V/Coil	$ 950
Toshiba 44Mb V/Coil	$ 980
Plus 20Mb Hardcard	$1095
Plus 40Mb Hardcard	$1245

PLOTTERS

Houston Roland

Hewlett Packard

TAPE BACKUP

Colorado 60Mb External	$ 925
Colorado 60Mb PS2 External	$ 815
Colorado 60Mb Internal	$ 675
Cipher 5400	$1450

VIDEO

Mono Card	$ 110
Everex Micro Enhancer	$ 350
Vega VGA	$ 490
Vega Vram	$1125
Genoa Super Hires	$ 395
Prisma 860	$ 330
Genoa VGA	$ 675

COMMS

AST 5251/11	$CALL
AST 3270/SNA	$CALL
IDEA 5251/11	$CALL
IDEA 3270/SNA	$CALL

MONITORS

NEC Multisync II	$1080	NEC Multisync 3-D	$1149
NEC Multisync 20 inch	$3895	ADI DM 12 Monochrome	$ 195
Taxan 770+	$ 995	ADI DM 14 Monochrome	$ 220
Taxan 780+	$ 725	Thompson Composite	$ 160
E120 8060 Flexscan	$1295	Phillips 14" Monochrome	$ 240
ECM5400	$ 625	Phillips 14" EGA	$ 750
NEC Multisync 2A	$ 795		

MEMORY

Intel Above Board Plus	$ 895
Hyperam AT 512Kb Lim 4.0	$ 825
Hyperam 286 2Mb Ram Lim 4.0	$1550
Idea Supermax EMS Ser/Par/512Kb	$CALL
Idea Supermax SMX Ser/Par/512Kb	$ 695
AST Rampage 286 Plus 512Kb Lim 4.0	$ 895

INTEL

80287-8	$ 399	8087-2	$ 250
80287-10	$ 445	8087-1	$ 360
80387-16	$ 775	80287-6	$ 270
80387-20	$ 870	80387SX7	$ 699
80387-25	$1080	8087-3	$ 175
80C287			$ 620

WITH FULL 5 YEAR WARRANTY

NETCOMM

1200 In Modem	$365	Auto Modem 24/24	$495
2400 In Modem	$455	Smart 21/23SA	$415
123 In Modem	$430	Smart 1200SA	$495
1234 In Modem	$530	Smart 123SA	$570
Auto Modem 123	$465	Smart 1234SA	$760
Auto Modem 1234	$580	Smart 2400SA	$680
Auto Modem 12/12	$385	Pocket Modem	$455

SYDNEY TEL: (02) 550 5333 FAX: (02) 550 5252 **MELBOURNE** TEL: (03) 419 7788 FAX: (03) 419-1414

$UPER STOCK-TAKE $PECIALS

CLEARANCE

PRICES ON ALL BRANDS

PLUS OVER $2,200 ABSOLUTELY FREE PRODUCT WITH EVERY COMPUTER PURCHASED WHILE STOCKS LAST

BEST PRICES ON **EPSON**

BEST PRICES ON **TOSHIBA**

BEST PRICES ON **AST**

BEST PRICES ON **MITAC**

Plus FREE

WordStar Professional V.5	$795
Dant Accounting solutions (incl. A/P A/R G/L & Invoicing	$1,295
Logitech Mouse	$195
TOTAL	**$2,285**

FREE ACCOUNTING & WORD PROCESSING PACKAGE WITH EVERY EPSON, AST, TOSHIBA & MITAC PURCHASED IN JUNE & STILL THE BEST PRICES

EPSON
- EPSON AX2 80286 CPU 12MHz, 640Kb RAM 6 expansion slots small footprint
- EPSON AX3 80386 CPU 20MHz 1Mb RAM 9 expansion slots large footprint
- EPSON AX LAPTOP 80286 CPU 12MHz 1 expansion slot 20Mb HDD 1.44Mb 3.5in FDD battery operated

DANT ACCOUNTING

Dant accounting package is an Australian designed package suitable for any size business. Features include: CASHBOOK, EXTENSIVE AUDIT TRIALS & AGED BALANCE LISTS WITH UNLIMITED NUMBER OF ENTRIES & MULTIPLE COMPANIES. Requires 640KB RAM & Hard Disk

TOSHIBA
- T5200 80386 CPU 20MHz 2Mb RAM 2 expansion slots 100Mb hard disk
- T5100 80386 CPU 16MHz 2Mb RAM 40Mb hard disk
- T3200 80286 CPU 12MHz 1Mb RAM 2 expansion slots, 40Mb hard disk
- T3100E 80286 CPU 12MHz 1Mb RAM 1 expansion slot 20Mb hard disk
- T1600 80286 CPU 12MHz 1Mb RAM 20Mb hard disk battery operated
- T1200 80C86 CPU 10MHz 1Mb RAM 20Mb hard disk battery operated Dual floppy and backlit screen options
- T1000 80C88 CPU 4.77MHz 512k RAM 720Kb FDD, MS DOS in ROM, LCD Display

AST
- AST 386/25 80386 CPU 25MHz 1Mb RAM 7 expansion slots with 32Kb cache memory, large footprint
- AST 386C 80386 CPU 20MHz 1Mb RAM 7 expansion slots with 64Kb cache memory, large footprint
- AST 386/16 80386 CPU 16MHz 1Mb RAM 7 expansion slots with 64Kb cache memory with large footprint
- AST 286 Premium 80286 10MHz zero wait 1Mb RAM 7 expansion slots large footprint
- AST 286 BRAVO 80286 CPU 8MHz zero wait 640Kb RAM 4 expansion slots, small footprint

MITAC
- Paragon 386E 80386 CPU 20MHz 2Mb RAM, 5 expansion slots, small footprint
- Paragon 386C 80386 CPU 16MHz 2Mb RAM, 5 expansion slots, small footprint
- Paragon 286V 80286 CPU 12MHz 1Mb RAM, 5 expansion slots, small footprint
- Paragon 286S 80286 CPU 10MHz 640Kb RAM, 5 expansion slots, small footprint
- Paragon PV88 8088 CPU 10MHz 768Kb RAM, 5 expansion slots, small footprint

CLEARANCE PRICES WILL NOT BE REPEATED

PHILIPS EGA MONITOR
14in multi display
.31 dot pitch
640x200, 640x350
anti glare screen
tilt & swivel stand

18 months Warranty

$AVE

TAXAN
780 VGA
Colour Monitor
$735

LOTUS 1-2-3
$464.00
(Future upgrade for only $55.00 while stocks last)

Prices subject to change without notice.

Size isn't everything!

SIZE ISN'T everything according to the doctrine of Sigmund Freud, but in the case of computer monitors, big is not only beautiful, it is also much more useful. While it is possible to use standard VGA graphics systems for graphic-intensive applications such as desktop publishing, there is a growing trend to use the larger 19 or 20-inch monitors for this purpose.

A standard VGA screen running side by side with an NEC Multisync II XL. Note the difference between the quality of the images, the amount of information displayed and the amount of space taken by the menus on each screen.

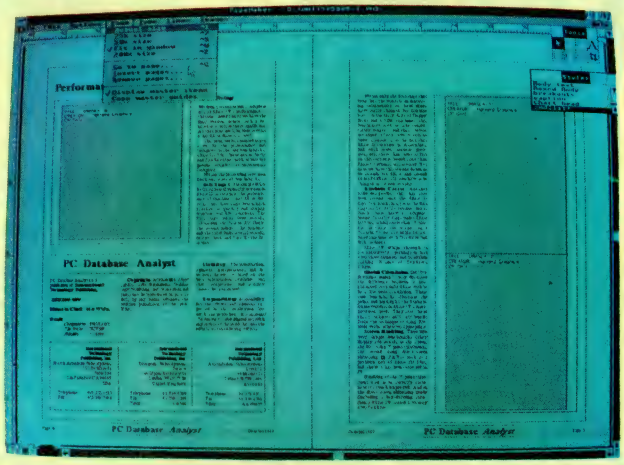
As many readers will know, using a standard screen for DTP can be quite frustrating as the present VGA standard and screens are not capable of displaying the detail necessary to make the text legible. For Mac users the same applies, although with the original machines, the MacPlus, the SE and the SE/30 all of which have nine-inch screens, the problem is more severe. In either case, the user is forced to constantly switch from one view of the page to another (in PageMaker, 'Actual size' to read and edit text, 'Fit to Window' to check pagination). Redrawing a screen, which occurs after each switch, can be a time-consuming process and so reduce the operator's productivity.

However, the large screen monitors change all of this by providing the best of both worlds: the ability to display an A4 page (or two) in actual size while maintaining the legibility of text right down to eight or nine points. This not only reduces the number of times needed to zoom in or out, but also the number of redraws that are necessary (although a repaint will take longer). And using a large screen has another advantage – WYSIWYG. Without one, true WYSIWYG is not possible, as smaller monitors can only display part of a page at a time, therefore showing only relative WYSIWYG.

There are two options available when moving up to a big screen. The first, and the most popular, is the 19- or 20-inch vertical monitor, which is similar in appearance to standard screens, only bigger and can display two A4 pages simultaneously. The second is the horizontal type, usually single-page displays and as you might expect, each has its advantages and disadvantages depending on user requirements.

Paul Zucker, of Paul Zucker Computing, recently purchased a NEC Multisync XL to assist with the on screen pagination of a number of newsletters distributed locally and internationally. According to Zucker, the Multisync has made life much easier. 'We can now view two A4 pages, side by side,' he said, 'and, in contrast to standard VGA screens, we can also read the text. This means we can make all the corrections without the need to zoom in and then out again. This makes it easier to grab paragraphs and change styles, to select blocks of text and manipulate graphics. It's also much easier for flowing text,' he said.

CAD/CAM users can also benefit from such a system as it allows them to view a great deal more information in much finer detail and this translates into greater cost and time efficiency. Financial consultants, who with the use of large screens can view a much larger portion of a spreadsheet than previously possible without the use of screen-font reducing techniques. And, in a similar fashion to desktop publishing users, word processing operators also stand to gain from using large



An illustration of the difference a large screen can make to desktop publishers. Although the pages are shown using the 'Fit to Window' magnification, the text is clearly legible.

screen monitors. By using the larger screens, an entire document is visible at once, in WYSIWYG format, without the need for scrolling. This can only help with the reduction of errors.

The other option open to large screen purchasers is that of the A4 single-page screen (portrait) which is a more cost and space efficient method of increasing the amount of information that can be displayed at any one time. According to John Hare, technical manager of Melbourne-based OnTheBall, a desktop publishing bureau, reactions to the Radius Full Page Display has been 'very, very favorable.'

OnTheBall has been operating for about three years and has four Mac IIcx machines available to the public for desktop publishing work. Three of the machines have the standard Apple monitor, and the other runs the Radius. OnTheBall does not need to be convinced of the merits of large screen displays, all of its graphic design team use Macs with Radius Double Page Displays (landscape). However, the A4 screen was chosen for use by clients as both space and cost were an important factor.

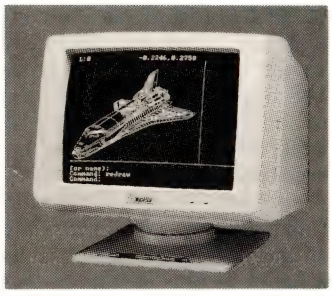
The major improvement the Radius offered was: 'being able to see the whole page,' he said, a feature that proved so attractive that customers frequently asked to use the machine with the Radius, according to Hare.

mum resolution of 640 by 350; dot pitch 0.31mm; horizontal scan of 15.7 to 21.8kHz. Twelve-month warranty. Australia Everex Systems (02) 427 6111.

CPD1301E Multiscan $1056
VGA, EGA, CGA, MDA, IBM 3270; 33cm diag.; non-glare, dark screen. Maximum resolution of 900 by 560; dot pitch (not specified); horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. Sony (02) 887 6666.

Princeton Graphics Systems Ultrasync 12 $1080
VGA, EGA, CGA, Hercules; 30.5cm diag.; dark, tinted, non-glare, etched screen. Maximum resolution of 800 by 600; dot pitch 0.28mm; horizontal scan of 15.0 to 35.0kHz. Three-month warranty. Intelligent Systems (03) 543 7988.

Taxan Multivision 770+ $1099
VGA, EGA, CGA; 36cm diag.; short persistence, non-glare tinted screen. Maximum resolution of 640 by 480; dot pitch 0.31mm; horizontal scan of 15.0 to 35.0kHz. Twelve-month warranty. Tech Pacific (02) 697 7111.



Teco 5154 $1099
EGA, CGA; 35.5cm diag. screen. Maximum resolution of 640 by 350; dot pitch 0.31mm; horizontal scan of 15.7 to 21.8kHz. Twelve-month warranty. MPA (03) 894 1500.

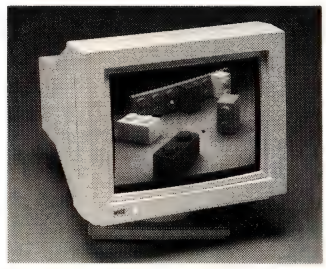
Thomson 4470D $1194
EGA, CGA, Hercules; 36cm diag.; non-glare screen. Maximum resolution of 720 by 350; dot pitch 0.31mm; horizontal scan of 15.7 to 22.0kHz. Twelve-month warranty. Peak Pacific (02) 901 0000.

Tatung CM1480 $1219
EGA, CGA; 39.5cm diag.; dark, tinted screen. Maximum resolution of 640 by 350; dot pitch 0.31mm; horizontal scan of 15.7 to 21.8kHz. Three-month warranty. IPL Datron (02) 698 8211.

Compaq VGA $1230
VGA, EGA, CGA, Hercules; 36cm diagonal screen. Maximum resolution of 720 by 400; dot pitch 0.31mm; horizontal scan of 31.5kHz. Twelve-month warranty. CCA Systems (02) 660 0077.

Forefront NTS 9600 $1258
VGA, EGA, CGA (supports SuperVGA, 1024 by 768); 35.5cm diag.; non-glare screen. Maximum resolution of 720 by 480; dot pitch 0.31mm; horizontal scan of 15.0 to 35.0kHz. Twelve-month warranty. SKI Peripherals (02) 649 1222.

Panasonic TX-14M6A $1295
EGA, CGA; 36cm diag.; tinted non-glare screen. Maximum resolution of 640 by 350; dot pitch 0.39mm; horizontal scan of 15.7 to 22.0kHz. Twelve-month warranty. National Panasonic (02) 886 0200.



Wyse 650 $1300
VGA, EGA, CGA, Hercules; 30.5cm diag.; high contrast, dark glass. Maximum resolution of 640 by 480; dot pitch 0.28mm; horizontal scan of 31.4kHz. Twelve-month warranty. Imagineering (02) 697 8666.

Teco 5155E $1413
VGA, EGA, CGA, Hercules; 36cm diag.; black matrix, direct etched screen. Maximum resolution of 800 by 600; dot pitch 0.31mm; horizontal scan of 15.7 to 35.0kHz. Twelve-month warranty. MPA (03) 894 1500.

Skai-Idek MF-5015 Flat screen $1490
VGA, EGA, CGA, Hercules; 38cm diag.; etched screen. Maximum resolution of 800 by 600; dot pitch 0.31mm; horizontal scan of 30.0 to 36.0kHz. Twelve-month warranty. Porchester Computers (03) 537 2722.

EIZO 8060S Flexscan $1818
VGA, EGA, CGA, Hercules, Macintosh II; 36cm diag.; Dark face, non-glare screen. Maximum resolution of 800 by 560; dot pitch 0.28mm; horizontal scan of 15.0 to 35.0kHz. Twelve-month warranty. Megavision (02) 975 1877.

CPD1402E Multiscan $2088
VGA, EGA, CGA, MDA, IBM 3270; 35.5cm diag.; non-glare, dark screen. Maximum resolution of 900 by 560; dot pitch (not specified); horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. Sony (02) 887 6666.

Electrohome ECM 1310 $2215
VGA, PGC, EGA, CGA, Hercules; 33cm diag.; Short persistence phosphor, tinted, non-glare screen. Maximum resolution of 720 by 540; dot pitch 0.31mm; horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. AWA Distribution (02) 888 9000.

Electrohome ECM 1311 $2215
VGA, EGA, CGA, Hercules; 33cm diag.; Long persistence phosphor, tinted screen. Maximum resolution of 720 by 540; dot pitch 0.31mm; horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. AWA Distribution (02) 888 9000.

Electrohome ECM 1312 $2215
VGA, EGA, CGA, Hercules; 33cm diag.; Long persistence phosphor, clear polished screen. Maximum resolution of 720 by 540; dot pitch 0.31mm; horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. AWA Distribution (02) 888 9000.

Skai-Idek MF-5115 Flat screen $2339
8514/A, SuperVGA, VGA, EGA, CGA, Hercules, Mac II; 38cm diag.; etched screen. Maximum resolution of 1024 by 768; dot pitch 0.26mm; horizontal scan of 15.0 to 37.0kHz. Twelve-month warranty. Porchester Computers (03) 537 2722.

Princeton Graphics Systems Ultrasync 16 $2490
8514/A, SuperVGA, VGA, EGA, CGA, Hercules; 40.5cm diag.; dark, tinted, non-glare, etched screen. Maximum resolution of 1024 by 768; dot pitch 0.31mm; horizontal scan (not specified). Three-month warranty. Intelligent Systems (03) 543 7988.

EIZO 9070s Flexscan $2730
VGA, EGA, CGA, Hercules, Macintosh II; 40.5cm diag.; Dark face, anti-static screen. Maximum resolution of 1280 by 800; dot pitch of 0.28mm (0.31mm available as option); horizontal scan of 20kHz to 50kHz. Twelve-month warranty. Megavision (02) 975 1877.

Electrohome ECM 1910 $5965
SuperVGA, VGA, PGC, EGA, CGA, Hercules; 48cm diag.; Short persistence phosphor, tinted, non-glare screen. Maximum resolution of 1024 by 512 (non-interlaced), 1024 by 800)interlaced; dot pitch 0.31mm; horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. AWA Distribution (02) 888 9000.

Electrohome ECM 1911 $5965
SuperVGA, VGA, PGC, EGA, CGA, Hercules; 48cm diag.; Long persistence phosphor, tinted, non-glare screen. Maximum resolution of 1024 by 512 (non-interlaced), 1024 by 800)interlaced; dot pitch 0.31mm; horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. AWA Distribution (02) 888 9000.

Electrohome ECM 1912 $5965
SuperVGA, VGA, PGC, EGA, CGA, Hercules; 48cm diag.; Short persistence phosphor, tinted, non-glare, clear polished screen. Maximum resolution of 1024 by 512 (non-interlaced), 1024 by 800)interlaced; dot pitch 0.31mm; horizontal scan of 15.0 to 34.0kHz. Twelve-month warranty. AWA Distribution (02) 888 9000.

DisplayColor Double page display $10498 (plus card)
Macintosh II; 48 cm diagonal screen. Maximum resolution of 1152 by 882; dot pitch 0.31 mm; horizontal scan (not specified). Twelve-month warranty. InfoMagic (02) 975 1044.

Tatung CM1495 POA
VGA, EGA, CGA, Hercules; 36cm diag.; High contrast, dark, tinted screen. Maximum resolution of 800 by 560; dot pitch 0.31mm; horizontal scan of 15.0 to 35.0kHz. Three-month warranty. IPL Datron (02) 698 8211. □

FLAT-PANEL DISPLAYS

With a minimum of the usual industry hype, flat-panel displays seem to be with us, although there are still improvements to be made, as Stewart Fist reports. . .

MOST PRESS releases I get – and I seem to get hundreds every week – tells me about some new 'amazing breakthrough' in computer or communications technologies. The more timid of these only proclaim that their particular product is 'unique,' 'innovative,' or at the 'leading edge.' Sometimes, if the in-house PR people are daring, the products become the 'ultimate' in scientific invention – ranking alongside Einsteins discovery of $E=mc^2$.

Of course, the more adventurous external PR consultants would only use these terms as a staging point on the way to new heights of hyperbole and exaggeration – they have their reputations to consider! So it is somewhat strange to find a new technology that has been sneaking up on us and which has begun to enter mainstream computing without the usual deluge of hyped-up press releases. There have been a few, but not to the degree that you would expect.

We seem to be finally at the stage of having flat-panel high-quality bit-mapped colour screens on our computers, and full-colour, full-motion large flat screens for television – something that has been promise for at least a decade.

We've had mono liquid-crystal display (LCD) panels for more than ten years, and small colour displays since 1984, but they haven't had the size or the quality needed to replace conventional computer screens. Generally, they have been too slow for more than laptop MS-DOS machines or novelty small-screen portable TV sets. The problems with flat-panels of all types have been manifold. Gas-plasma and flat cathode-ray tubes proved to be too thick and power-hungry for portables, although they may still be the technology of the home wall-panel display; electroluminescence hasn't lived up to its early promise; but LCD technology has progressively been getting better.

Organic compounds

THE TERM 'liquid crystal' refers to the fact that some long-chain organic compounds can exist in stable phases (called 'mesophases') half-way between liquids and solids. Liquid crystals exhibit three forms: smectic, nematic, and cholesteric. Cholesteric liquid crystals are used, for instance, in those stick-against-the-forehead temperature meters that change colour when you're sick. In the nematic phase, used by most LCDs, the molecules exist either in a twisted-helix form or align in parallel, depending on the electrical or magnetic fields surrounding the crystals. They can also change with temperature – but electric capacitance is the normal controlling mechanism.

To create a twisted nematic liquid crystal display, they sandwich the material between two plates of glass whose surfaces are finely grooved by an etching process – with the grooves aligned at right-angles to each other. On the adjacent surfaces are deposited transparent addressing conductors (usually indium-tin-oxide) etched into 'rows' on one sheet, and 'columns' on the other. This then creates a pixel and conductor matrix – if you could see it magnified, it would look like a fly-wire screen.

When a positive voltage is applied to one 'row', and a negative voltage to a 'column', the pixel (which is at the etched cross-road holding the LCD material) between the conductor intersection becomes the dielectric in a capacitor, and this electrical change is enough to modify the polarisation of light passing though. Top and bottom polarising materials enhance this difference, and so the screen can be seen either by transmitted, or reflected, ambient light.

The glass sheets used for LCD screens must be very flat and extremely consistent in thickness – to the point where only a couple of glass-makers in the world can make sheets to this standard. Added to this, you've got the problems or producing large runs of photo-lithographic etched panels, the deposition of transparent conductors, and the accurate positioning and separation of the conductors and contact leads.

So it's no wonder that they've always had a quality problem with large matrix displays – whenever you double the dimensions you increase the chance of defects in each stage of the production process a dozen times or more – and that applies to the glass quality, the etching processes and the depositing and etching of the conductors. If you want a rough figure: doubling the size of a display increases the production problems about 100-fold. That's why there are plenty of small colour screens around, but not many large.

Monochrome super-twist nematic (TN) LCDs are the current fashion, and many of these use a liquid crystal material doped with a coloured dye to provide the contrast, without the need for polarizers. These panels get over some of the problems from the greyishness of the polaroid screen – but some of them also bleach in direct sunlight. In addition, many super-twist panel manufacturers are now illuminating their screens from behind with fluorescent materials – thus increasing the contrast and making the panels suitable for low light use. This is state-of-the-art at mid-1989 – but don't invest your cash in this technology, just at present.

When it comes to full-colour panels, LCD techniques get very complex in terms of addressing the individual pixels that create the image. To get colour the manufacturers use four dots (red, blue, green and white) instead of one, and when you couple this with size-expansion and better resolution, the problem of addressing pixels individually becomes impossible. Imaging how many address lines you would need with a million pixels.

Time multiplexing is one solution. This is the flat-panel equivalent of the way your computer scans the keyboard – in effect applying the voltage to one pixel at a time and stepping through a range of, perhaps, 128 pixels. At one time this appeared to be the answer to the addressing problem,

but multiplexing creates other problems – specifically low contrast.

Solutions

NOW THE solution seems to be in treating the panel as if it were a gigantic silicon chip, and building the driver electronics into the panel though successive layers of transistors, capacitors, and so on, using thin-film technology. The philosophy behind this design is that the less the panel needs to deal with outside electronics, the less contacts and driver connections it will need.

The other major problems of LCDs – narrow viewing angle, low-light viewing and contrast ratio – are also progressively being solved. At one stage 20 per cent viewing angles were good and 4:1 contrast ratios were excellent; now we have 50 per cent viewing angles and 20:1 ratios. However, there is always some trade-off between high-resolution addressing systems, viewing angle and contrast – and also between all of these and power consumption.

Since there's not much new to show you out in the market yet apart from the current spate of dye-coloured super-twist nematic LCDs with fluorescent backlight, I guess I should substantiate my claim that we are, at last, seeing a breakthrough, by tendering some exhibits for display:

- GE has a 1 million pixel, 50:1 contrast ratio, 9-inch diagonal, colour LCD screen for avionics, in production.
- Towards the end of last year Hitachi demonstrated an 8-colour liquid crystal display screen two metres square.
- Toshiba and IBM Japan have produced a 16-colour, 14.26-inch diagonal (10-inch square) screen using active matrix technology which displays 770 by 550 (423,500) pixels, with each pixel composed of red, green, blue and white dots.
- Toshiba has a 12-inch diagonal ferroelectric colour LCD screen which easily handles television data rates.
- Sharp has managed to pack 307,200 pixels into a 5-inch diagonal colour display by using a specially developed thin-film transistor layer.

There has always been a theoretical advantage with LCD, in terms of picture resolution and power drain over plasma and CRT technologies, and these advantages are beginning to show. Gas-plasma techniques are still being developed for large flat-panel wall television screens where resolution and power isn't a problem – but LCD seems to be the portable technology-of-choice.

Television

OF COURSE, flat panels are not only used for computer graphics, but also for television – both for portables, and for the futuristic large-screen 'Star-Wars' panels that the gurus of 'Beyond 2000' keep telling us the way of the future. Full-motion video images have always given the flat-panel technologists more trouble than computer graphics because there is an inherent lag in LCD screens, and if you've got realistic images moving in real time then image lag becomes a substantial problem.

It is here that the research for television display and for portable computers diverge. Portable MS-DOS computers ideally need to have an image that 'sticks' on the surface of the screen for a considerable length of time so that the computer isn't wasting battery power and cycles constantly updated the screen with essentially the same information. You can see this resistance to change in conventional B&W LCD screens on lap-top portables – but this is one of the reasons why Apple have taken so long to bring out their portable Macintosh. They've got mouse trouble. Apple Macs need a screen which can handle fast cursor movement, and television needs a screen that is even more quickly refreshed – so if a character runs across the screen it doesn't leave sheets of ghosts trailing behind.

Conventional LCD computer screens haven't proved to be fast enough to handle the movement of the mouse/-cursor, and so Apple's point-and-click interface becomes a bit of a problem. For this reason Apple have been hard at work on active-matrix display for the Mac.

These LCDs rely on an 'active' switching transistor behind every screen pixel. The idea is to simplify the addressing of the picture elements and at the same time speed up the addressing process. There have been a number of breakthroughs recently in active-matrix technology, but it is one thing to have working experimental models, and another to get production runs with a high enough percentage of usable panels when you've got millions of transistors spread over large areas of screen. However active-matrix panels have finally made it from the laboratory to the factory – so we should begin to see them in the next few months. The release of this latest raft of flat-panel displays came at the Society for Information Display symposium in May of last year – appropriately enough at Anaheim, California, the home of Disneyland.

The resolution of LCD images is defined by the accuracy and fineness of the etching at the pixel intersection – and theoretically we should be able to etch finer and finer lines on larger and larger screens. Plasma and CRT technologies run up against well-understood theoretical limits.

Highest resolution

THE HIGHEST resolution colour panel shown at the Society of Information Display conference (see the box item) was a one-million pixel liquid crystal screen measuring 16cm square (6.25 inches). This comes from General Electric's New York aircraft instrumentation laboratory and is already in production. The display is small in size for such high-resolution because it is designed for a specific instrumentation purpose, but it has demonstrated an order of advancement in the technology which will soon flow on to more conventional applications.

The GE screen had more than twice the number of driver transistor and pixel elements than any technology previously shown, and it demonstrates a 50:1 contrast ratio and a 50-degree viewing angle which gives the user a considerable range of movement and viewing conditions. Remember, this is not a lab demonstration, but a screen actually in production! The driver transistors are deposited on a glass substrate using thin-film techniques, and the twisted-nematic liquid crystal material is then layered over the top. With so many transistor and display elements, defects are expected, so redundant transistors and signal paths are included in the design. After an initial inspection, pulsed-xenon lasers are used to cut old defective pathways and create new ones to activate the redundant elements.

At this stage in the development, already 40 per cent of the panels from the production line can reach the guaranteed one million working-pixel level but, at present, the costs involved will limit the use of these displays to avionics. However GE are also producing some 10cm (4-inch) square displays having 160,000 pixels with

8 DISKS FOR UNDER $80

QUALITY PC PROGRAMS

We are pleased to bring you a selection from our extensive range of software for MSDOS.

WORD PROCESSING

MW001: GALAXY Popular Worstar compatible w.p., pull down windows, good documentation and easy to use.

MW049: HYPERTEXT BLACK MAGIC. 3 Disks. $30. Expand information by linking keywords and info blocks to one another. Note, Reference and Replacement links.

MW021: WRITERS HEAVEN. v1.1. Program that transforms PCWrite into the fastest, most efficient editing tool available.

MW018: SLICKWORKS Intergrated program for those who require fast and easy word processing, mail list merging and more.

MW050: GRAPHIC TYPING TUTOR. Req. CGA/EGA. PC-FASTYPE+. 2 screen displayed keyboards, easy to use and highly recommended.

MW037: BARCODE. Creates labels using code 3 of 9, alphanumeric code of numbers 0 to 9. Print labels up to 15 characters in length, wide range of printer support.

MW038: BUSINESS CARDS. Now you can make your own business cards, choice of text and borders, also supports colour printers.

MW020: MACROS FOR WORD PERFECT. Over 60 macros on this disk including Alt2, Boxer, Helwin, Fontsize, Automerge and more.

MW048: WRITERS TOOLS. A new collection of tools for writers programmers - features word/line count, upper to lower case, encrypt/decrypt and much more.

MW013: TEXT CONVERTERS. 2 Disks. $22. Convert files from/to ASCII to Ventura, WordPerfect, Multimate Wordstar 3, 4, 2000, DCA, Displaywrite. Do subscript, change line spacing.

PRINTING

MW040: STIKME. Excellent label printing program allows compressed, enlarged, underlined labels. Easy to use and highly recommended.

MW042: PRINTER CONTROLS-SCREEN DUMPS. (1). Gemini 10x, Toshiba- has Grafix for Epson MX-80, Herctosh, Okidump, Pan1090 and 7 more.

MW045: PRINTING AID FOR WORDSTAR Do subscript, change line spacing and more. Not compat with Amstrad W/Star.

MW024: LETTERHEAD/GRAB. Design your own letterheads, envelopes/ logo. Grab-point at the address on the letter, grab it and print an envelope.

MW051: LASER FONT FILTERS. Convert soft fonts of LJ and produce hollow outlines and 3D effects with shadows.

GRAPHICS

MG026: 3D BLACKBOARD. Create your own design, drawing in 3D. Save, rotate, print it out. Great program.

MG036: MANDELBROT IMAGES. EGA, VGA. Create patterns based on "Fractal geometry". On line help and samples included.

MG011: AUTOCAD TOOLS. Printer drivers for Epson, Okidata, read an ADI plot file and generate near plotter quality output on a dot matrix.

MG024: ANIMATED GRAPHICS. For mono, CGA/EGA. New program that runs through a series of superb graphic shows. No user input.

MG034: SUPERGRAPHICS. Excellent new program to view/print many graphuic formats-IMG, MSP, PIC, RAS, DCOPY, PC Paintbrush(Black and white only), DGI and much more.

MG030: DATA PLOTTING ANALYSIS. Show your data on a line plot graph. Danalv1.01. Output from this program may be plots, listings, and/or processed data files.

MG031: 2D DATAPLOT. For scientific data analysis and presentation. Menu driven, easy to use. Graph types include linear plot, single and multiple cycle log plots etc.

MG021: IOPTIKS. Graphics display and conversion. Reads graphic files from Macpaint and over 10 more and supports direct reads from Canon IX-12 scanners.

MG023: PRINTMASTER/PRINTSHOP TOOLS. V1. 0. 104 new sports graphics for PM/PS, prints a listing of icons in a library and converts to a windows, paint format file.

UTILITIES

MU035: SPEED VARYING/ UNPROTECTION Good collection to speed up or slow down your computer. Also has an excellent set of unprotection utilities and Zork tools.

MU025: VIRUS and WORM IMMUNISATION Will give you added protection for your hard disk. Excellent program and very popular.

MU057: EMULATOR FOR 8087/287/387 Works with most Turbo programs which support maths coprocessors memory resident.

MU034: MAGIC MENUS. Excellent DOS front end, lets you create your own menus, pop up windows for file listing, directories, full screen editing.

MU058: HARD DISK BACKUP CONTROL. 2 Disks. $22. New program includes Restore with source code. Menu driven. Recommended.

MU036: TREEVIEW. Hard disk and file management utility. Simple commands to accomplish everyday operations, full screen interface with user selectable colours. Mouse support.

PROJECT / TIME MANAGEMENT

MU048: MAKE MY DAY. Memory res. full management package, an appointment calendar, job scheduler, expense account tracker for 1 or several people.

MU053: PC-TICKLE. Display your daily agenda, view current, future and past schedules, balance your chequebook and much more.

MF035: APF PROJECT MANAGEMENT Excellent menu driven set of project management tools which use high res. graphics. Fast and easy to use.

MF006: GANTT CHARTS and QUICK GANTT. Produces presentation quality Gantt charts, displays project status. Quick Gantt will allow up to 36 tasks.

GAMES GAMES GAMES

GRAPHIC

ME199: INVADERS. One of the best space invaders type games available. Lots of fun and very addictive-a top seller.

ME203: HAMBURGER. Great new arcade type game, you must shoot and catch the food to make up the burger. Also many other good games.

ME208: DESERT WARRIOR. You have survived a nuclear war and are in a desert fighting for survival against the Desert Vandals. Great graphics and very entertaining.

ME184: ARTIC WAR. Excellent graphics, you are a tank commander in the artic, pitted against enemy tanks, mines and planes. You must locate and destroy the enemy fortress.

ME005: MARTIAL ARTS. Great graphics as you battle the ninjas to enter the palace. Levels of difficulty make this an exciting game.

ME193: PACMAN PLUS: 3D. Pacman is included, as well as the best of a variety of other pacman games. Good value.

ME214: OSBIT. The ultimate computer game. Requires CGA/EGA. The computer system has been hit by a power surge, some BITS have escaped into the computer - especially OSBIT.

ME215: APOLLO MISSION SIMULATION. Requires CGA/EGA. Has tutorials on orbital mechanics and the physio of motion and gravity. Entertaining and educational.

ME175: CAR RACER. If you fancy yourself as a race car driver this will test you out. Beware of the oilslicks, bumps, and ramps. Batalia also included on disk.

TEXT

ME145: LEYGREFS CASTLE. Enter the mysterious castle to find the orb of power. Get the Runestaff before you teleport youself.

ME141: McMURPHYS MANSION: A Scottish uncle has left you his mansion. To claim it you must find the hidden treasure.

MUSIC

ME166: PIANOMAN. Compose your own music, save it and play it back.

ME195: COMPOSER. Graphic based music editor that allows you to see notes on screen. Compose, edit and play back.

ME213: DULCIMER TUNER. Requires CGA/EGA. Learn how to tune your musical instruments, good tutorial.

BOARD GAMES

ME171: OMEGA CHESS. Fantastic 3D graphics. 16 levels of difficulty and analysis of game. TOP SELLER.

ME212: PENTE. This popular board game requires CGA/EGA. A bonus game for strategy buffs is included - PYRAMIDS - have fun in the land of the Pharoah Cheops.

ME013: MONOPOLY. 3 versions of this game on 1 disk including a full graphic version.

MONO SPECIALS

ME200: MONO GAMES. (1) Excellent collection includes Attack, Starglide, Round A2, Digger and more.

ME201: MONO GAMES. (2) Fun collection includes Moonbugs, Hostages, Pitfall, Death 2 and more.

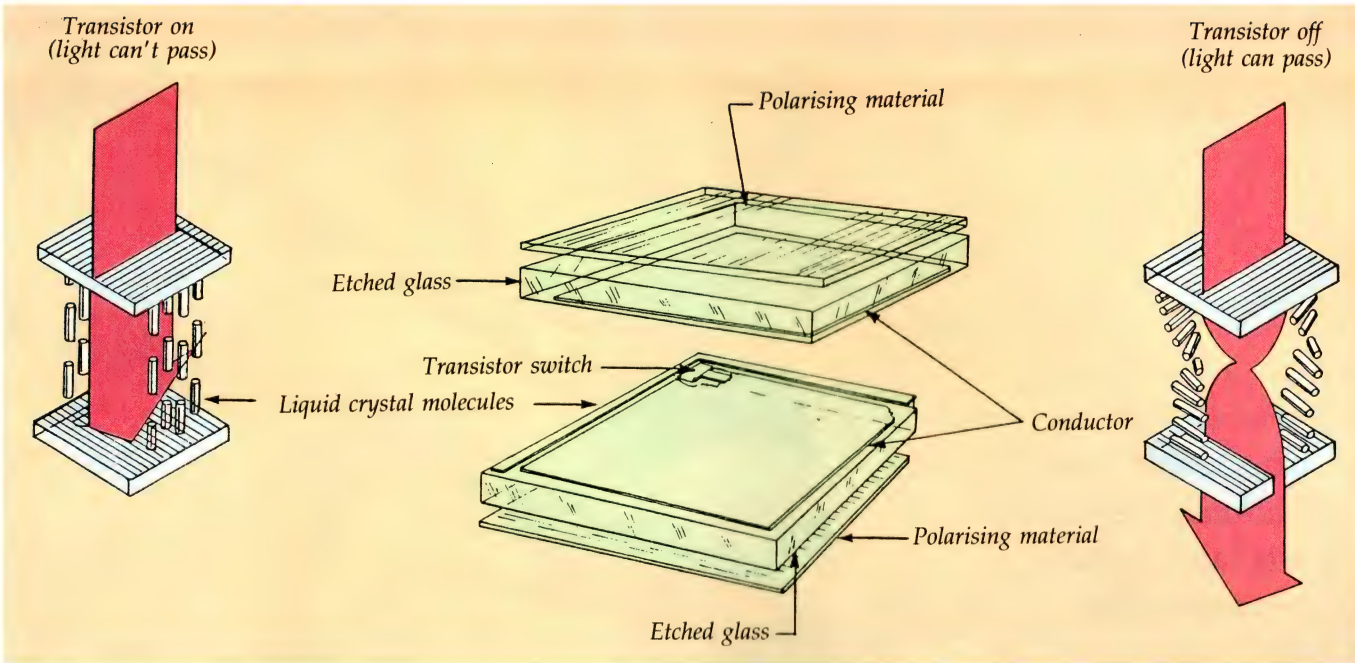
PHONE US WITH YOUR ORDER

(02) 262 3401
(02) 262 3402
FAX (02) 262 3403

OR CALL IN AND SEE US, VIEW THE DISKS AND MEET OUR FRIENDLY STAFF AT
2ND FLOOR, 3 BARRACK STREET
SYDNEY NSW 2000

D.M. SOFTWARE

FREE COMPLETE CATALOGUES FOR MSDOS, APPLE & COMMODORE ARE AVAILABLE ON REQUEST



The term 'liquid crystal' refers to long-chain organic compounds in stable phases half-way between liquids and solids. To create a twisted nematic liquid crystal display, the material is sandwiched between two plates of glass whose surfaces are finely grooved by an etching process – with the grooves aligned at right-angles to each other. On the adjacent surfaces are deposited transparent addressing conductors (usually indium-tin-oxide) etched into 'rows' on one sheet, and 'columns' on the other. When a positive voltage is applied to one 'row', and a negative voltage to a 'column', the pixel (which is at the etched cross-road holding the LCD material) between the conductor intersection becomes the dielectric in a capacitor, and this electrical change is enough to modify the polarisation of light passing though. Top and bottom polarising materials enhance this difference, and so the screen can be seen either by transmitted, or reflected, ambient light. (Diagram courtesy of General Electric, Aircraft Instruments Department.)

a yield rate of 75 per cent – which begins to look more like the viable standards required for consumer products.

An alternative to this active-matrix approach is still the use of multiplexing. Toshiba had on show at Anaheim a 24 by 18cm (30cm diagonal) flat panel colour LCD panel operating at the full NTSC video speed which is a few per cent faster than our PAL system. The contrast ratio on the Toshiba panel is only 10:1, but the screen displays a pixel matrix of 640 by 400 (256,000) which is plenty for television, and getting close to matching the resolution of an EGA monitor.

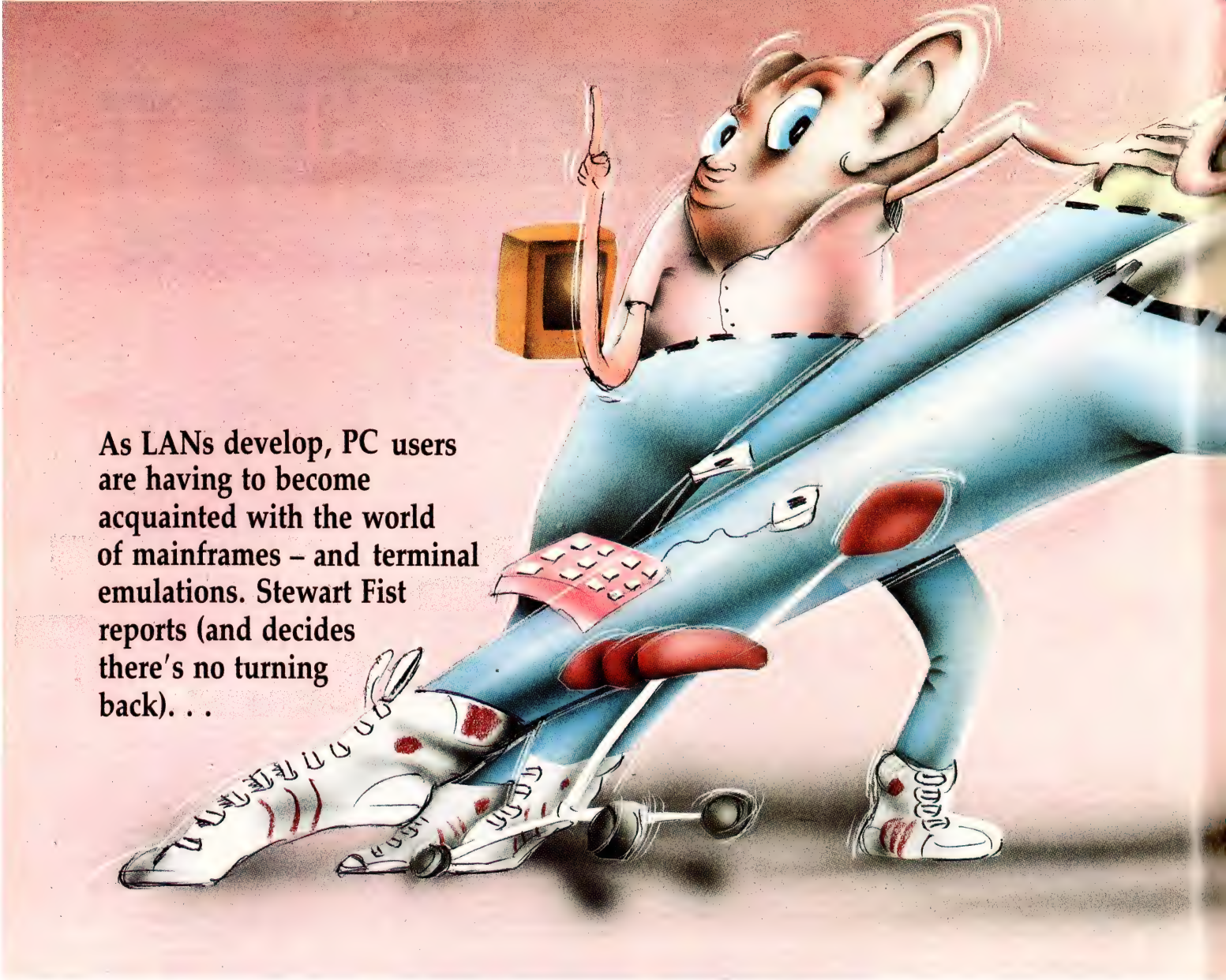
For this television screen Toshiba are using a ferroelectric technology which is known for its fast switching rates and bistable operations, although it does presented manufacturing problems. The response time of the ferroelectric material is about 30 microseconds which allows many screen elements to be successfully multiplexed without degrading the image quality, and this is a major breakthrough in simplifying the driver design for this kind of flat-panel TV display. Toshiba's breakthrough seems to be in multiplexing these elements while maintaining resolution on the screen and keeping the contrast range at an acceptable level.

The British GEC research group were also showing a very similar television ferroelectric technology but in monochrome. It seems to be generally accepted now that ferroelectric is the way to go for the medium-resolution fast-action colour television screens of the future, while active-matrix is the way for computers with higher-resolution requirements.

Mitsubishi have also taken the active-matrix approach with a high-resolution Red/Green/Blue (RGB) monitor screen intended to replace existing EGA screens for Japanese IBM-compatible systems. This development is only at the experimental stage at present but it is already achieving a vertical resolution of 450 pixels, with 1920 (3 times 640) pixels horizontally on a 20 by 24cm (27cm diagonal) screen. This is a total of 768,000 pixels and a reasonably large screen area.

The active-matrix technology means that Mitsubishi has had to work with 5-micron element separation – not much above silicon chip standards, but with areas much larger. They have had to lay three colour banks of thin-film transistor drivers, with an enormous number of interconnections within these control circuits. It is in translating these processes to the production line where problems will occur – with three or more layers it is very easy to fix defects later with pulsed-xenon lasers.

The use of thin-film transistors and capacitors to create active-matrix addressing allows the LCD makers to keep contrast ratios high (in the 12:1 or 15:1 region generally) while keeping costs down. Effectively, all of these displays are integrated circuits on a tremendously large scale. But it is ironic that after all these years of trying to cram transistor elements into the smallest possible chip, the production problem is now in making the largest chip possible. □



As LANs develop, PC users are having to become acquainted with the world of mainframes – and terminal emulations. Stewart Fist reports (and decides there's no turning back). . .

A CASE OF TERMINAL EMULATION

TECHNICAL WRITERS often forget that most readers have never used a mainframe. A few years ago you could bank on readers knowing something about mainframes and time-sharing, but today 'time-sharing' is associated with those rip-off holiday scams rather than computerisation. But an understanding of micro-to-mainframe links is becoming increasingly important as personal computers (which used to mean 'stand-alone' computers) now join large business systems through LANs (local area networks), direct links, or packet-switching networks.

One much-bandied term is 'terminal emulation', which dropped out of fashion for a while but now seems to be making a comeback. It applies to software/hardware combinations which are able to mimic or impersonate the characteristics of one (or more) of the more popular video terminals. And terminals were the way you talked to mainframes.

There are a lot of ramifications associated with terminal emulation that aren't at all well understood by most PC users. The subject includes special software, plug-in boards and protocol converters – although more recently the industry has emphasised technologies that 'gateway' through a LANs. Despite this, direct point-to-point terminal emulation is still important – in fact, it is probably still the dominant way in which micros and mainframes communicate. Last year IDC Research in the States estimated that micro-mainframe linking software sales were more than $1.2 billion, with the manufacture of hardware terminal emulation boards nearing the 400,000 units mark.

First of all, let's get our terminology straight. Originally all mainframe terminals were 'dumb' terminals, and most of them were printer – as distinct from video – terminals. You had a keyboard and a typewriter-style printer-unit all in one. Later VDU screens became popular, and the printer was then often relegated to a peripheral.

Dumb terminals

DUMB IS A relative word: the first terminals were really in the single-digit IQ range. They were able to display the incoming text characters at the current position of the cursor only, and the most intelligent thing they were called upon to do was to interpret the 'format effector' commands – non-print control characters like line feed, form feed, tab and backspace. The modern equivalent would be something like the most primitive word processing program you could imagine.

With video display units (VDUs or CRT terminals) came some local memory to buffer the information before it was fed to the printer, and along with memory came built-in intelligence which gave the terminal both processing power and the ability to handle the interface with peripherals. At the base level, these 'not-completely-dumb' video terminals would usually be able to interpret and generate control (Escape) sequences which were used to set and report the cursor position, and handle simple editing tasks. They could set the video attributes, insert and delete either lines or characters, clear all text from the screen, and even protect data-entry fields. This was the equivalent of, say, an early Apple II word processor or a CP/M text editor.

As we go up the IQ scale, we get 'smart' and then 'intelligent' terminals which are able to handle (to varying degrees) the manipulation of data and the graphic layout of display elements on the screen. An intelligent terminal is actually a special-purpose computer system which is symbiotic with a mainframe or mini.

You can upgrade some intelligent terminals to the status of a micro by adding a kit with a central-processor, some ROMs and an operating system, but this is a little crazy. The growth in micro-to-main-

frame links comes from the fact that PCs are often now cheaper than specialised terminals.

Part of the problem with micro-to-mainframe links is that micro users' expectations are so high; they don't readily accept the limitations of mainframes and terminals. They assume that they can simply add the simplicity and freedom or a micro to the power and range of the mainframe, without problems or losses of function. But access security and the reliability of data becomes a major problem when both computing power and alternative application programs exist outside the control of the mainframe. You can't just allow anyone to download mainframe data, play around with it for a while, then put it back without supervision.

Intelligent terminals

THE VALUE OF an intelligent terminal is that it exists as a fixed peripheral to a mainframe, and it has been designed to interact with the mainframe in a standardised way. The mainframe controls the process entirely. Generally terminals and mainframes are linked by coaxial cable, although increasingly terminals communicated over phone lines using modems.

There are other differences between the ways mainframes and micros handle data as well. Since mainframes are multi-user devices and communicate at high speed with their peripherals, they often move data in 'blocks' as distinct from the character-by-character processes of micros. Mainframes also prefer to use synchronous communications, whereas micros are async, and these differences cause problems. Then there's the problem of 8-bit versus 7-bit systems. So terminal emulation (the mimicking of a terminal) is quite separate from the problem of protocol emulation (which involves conversion between different communications standards). These are distinct problems, but they often go hand in hand.

Intelligent terminals are designed for special functions, not only for specific mainframes – so you can't just create a list of features/requirements and classify terminals accordingly. Some terminals are very intelligent one way, but not so smart in another. However, with varying degrees of skill, an intelligent terminal should be able to validate and range-check data, and it should be capable of blocking, compressing and storing data. We can expect that it will also perform functions like transferring files, handle general interactive communications, do internal calculations, store data, and format output for printers and peripherals.

Each system is different, but generally we don't want to be limited to line-by-line addition of text – we want to be able to zip around a spreadsheet adding or altering text/numbers as we go, and have this interpreted correctly back at the mainframe end. In the early days, when all we did with a mainframe was to transfer unformatted text and numerical data either way, the dumb terminal was satisfactory: the standard ASCII character set was all you needed. Nowadays we want to run full-screen editors, spreadsheets and other programs that require control over what is where on the screen, so we've got to provide both geographical and textual information to the mainframe.

Different computer terminal models use different codes for things like cursor positioning, highlighting, and control of scrolling. They may even use different keys in particular ways, other than simply as generators of ASCII characters. For instance the Break key on most terminals causes a mainframe to stop what it is doing, but micros don't have an equivalent. This is because the Break key does not transmit an ASCII character – what it does is to send a Logic-0 signal for between 150 to 250 microseconds – which is basically an electrical (rather than a logical) code.

The growth in micro-to-mainframe links comes from the fact that PCs are often now cheaper than specialised terminals.

Modern mainframe and mini systems are sometime now able to operate with a range of terminal type – a flexibility that has been built-in to satisfy customers who don't want to completely replace their system every time their processor is upgraded. This is an advantage, of course; it allows us to use VT100 terminal emulation (originally for the DEC) on some IBM mainframe systems for instance.

Minis and mainframes usually have an operating system that maintains a 'capability' database for the different terminal types it expects to find. If you are using a full-screen editor on a VT100 terminal, the host computer will use its O/S database to interpret those special VT100 keyboard functions so as to manage the screen. At other times your local editor will be working directly with data in the terminal memory, without central processor interaction. The mainframe O/S must know when to act on control codes, and when to leave the terminal to get on with its own tasks. This is why terminal emulation gets so tricky.

There are also variations within each standard, so often an emulator that only matches 'most of the functions' of a particular terminal will work satisfactorily with the mainframe, and other times it won't. Quite often you'll find that certain functions haven't been emulated – so you need to check software carefully before you purchase. Further complications with one-to-one direct communications come about because the larger mainframes often don't support slow-speed terminals requiring a separate line using asynchronous remote terminal connection. Larger systems may connect many terminal through the one port using a cluster controller.

IBM 3270

THE MOST COMMON of the terminal families used with a cluster controller is the IBM 3270 series (specifically the IBM 3278/9) which use a different character set, a different communications protocol, and even a different type of wiring from the 'normal' ASCII async terminal. An asynchronous terminal will send out data whenever you enter a keystroke, but a 3270 series terminal holds data progressively and waits for a request directed specifically to it from the mainframe. It then dumps one or more screens of data out to the controller: this process is called 'polling' and it allows a number of terminals to share the same linking line – it is very similar to a token-passing system.

These links between the mainframe and the cluster controller are also synchronous which makes for faster movement of data, and they use IBM's older Bisynchronous (BSC) or the newer Synchronous Data Link Control (SDLC) protocol which provide a more complex error-checking and addressing capability that we use in the micro world. These protocols are part of IBM's Systems Network Architecture (SNA) layered set of communications 'rules'. To top this off, the 3270 series uses an 8-bit character set called EBCDIC

instead of ASCII, so to link these units to the micro world you need the proverbial 'little black box' (which can also be a plug-in card) called a protocol converter – this sits in the line between the computer and the modem.

Although these terminals use bisync communications, note that the software that you use to emulate them will be the standard async type since the conversion will be handled by the box. You will generally find that the choice of emulation needed, will most often be DEC's VT100 – even though you are talking to an IBM mainframe. Most protocol converters are set up to accept a VT100 terminal. There has been some attempts made to standardise terminal devices and codes. The ANSI (American National Standards Institute) tried in the late 1970s with three X3 Committee standards (X3.4, X3.41 and X3.64) and a few manufacturers conformed to these for a while. Lately there has been some promotion of ANSI-compatible standards. The words seems to mean, like Humpty Dumpty, exactly what the individual terminal makers want them to mean.

The ANSI standard known as X3.4 (1977) is the most widely recognised and followed. It defines the ASCII 7-bit representation of control and graphic characters including the format effectors. If you try to read ANSI standard documents, you will find that the 'invisible' control codes (which includes the format effectors) are known collectively as CO sets, and graphic codes (here meaning graphics in the sense of printable 'text') are known as GO sets.

Not long after the original 1968 definition, the standards people began to realise that a range of only 128 possibilities provided by seven data bits was far too limited. But since the eighth bit was often used for other purposes in communications, it wasn't possible just to extend the ASCII character-set to expand the range. The X3.41 standard was a valiant attempt to have the best of both worlds. First of all ANSI set aside four control codes from the original 7-bit set as special-purpose codes. This is an old technique originated in the Baudot teletype system where one character is used to signal that 'the following character should be interpreted as. . . whatever.'

For instance: if you transmit the Esc (Escape) character, then follow it with an @ sign (Shift-2) then this might mean something entirely different to either the Escape or the @ key on its own.

The four special-purpose codes that were defined are still fairly widely used. Shift-In (SI – which is decimal 15 or Ctrl-O) and Shift-Out (SO – which is decimal 14 or Ctrl-N) are used to define alternative graphic character sets. The Escape Esc key is used to signify a new range of control codes, and the Data Link Escape key (DLE – decimal 16 or Ctrl-P) extends the control code range into data transmission control functions.

The last of the ANSI terminal standard attempts was X3.64, written in 1979, which tried to set-up standard Escape sequences for specific purposes, such as positioning the cursor on the screen. If this standard had caught on then a lot of on-line graphic applications would have become simple and possible, but it didn't. The 1979 attempt at standardisation also established a coordinating 'library' of sequences. If, say, you were designing a new terminal and you used an Escape code sequence in a new and unusual way, you were supposed to register this with ANSI and future designers would then (presumably) follow your lead. It was a praiseworthy attempt at co-ordination that didn't work. □

Remote terminals

REMOTE TERMINALS generally communicate in ASCII using asynchronous RS232 serial communications, and since most micros can output standard RS232 serial signals, all they generally need is a terminal emulation software package or a plug-in board which has the emulation built-in on ROM. There are about six terminal standards that really matter:

□ At the base level we have Teletype emulation – often called TTY emulation – and this refers simply to the dumb 'printer' terminal mode. It uses only the normal ASCII text and number set of characters and the format effector control codes.

□ Ignoring the special problems of the IBM 3270 series, the most popular of the 'real ASCII' terminals is DEC's VT100 (which incorporates the VT52 mode); there are hundreds of thousands around the world. With the VT100, DEC followed the ANSI standards reasonably closely, but it ignored some ANSI recommendations and added many private DEC functions. Most VT100 emulators will provide a selection which enables you to also implement ANSI/VT52. There are usually some DEC functions that you can't emulate on the PC. For instance most PC's asynchronous communications cards will only support a single rate for data coming in and going out, so you can't select different speeds as you can with a true VT100 terminal. Also, few emulators will support the VT52 graphics mode – although most have a VT52 mode of some sort.

□ IBM's 3101 ASCII terminal is also important in most parts of the world. This was a break from tradition for IBM; prior to the 3101 they had been trying to force their own EBCDIC (8-bit) communications standard on the world in competition to the ASCII (7-bit) standard. Naturally, IBM's own emulation of the 3101 on the IBM PC is excellent: it comes as close to the real thing as is possible. There are a lot of special control codes used in 3101 emulation – codes to set tabs, clear tabs, read cursor address, cursor motion controls, insert and delete characters and lines, erase to end of a field, lock and unlock the keyboard, etc.

□ We can access the range of IBM computers using the 3270 environment in a number of different ways. We can use outboard hardware which incorporates protocol conversion; or by a combination of hardware and software we can make the micro appear to be a cluster controller; or we can emulate (with hardware and software) the 3278/9 terminals that normally connect to the cluster controller. The Irma board has made Digital Communications Associates a small fortune because it emulates a dumb 3270 terminal without hassles.

□ TeleVideo's 910/920 terminal series is also widely used. It is packed full of video attributes and control capabilities, and it has some special quirks that often make emulation difficult: programmers have all sorts of trouble writing code that can manage screen displays. TeleVideo's 912 terminal differs only a little from the 920 mode.

□ The last (and least exotic) of the common terminals around is the ADM3a which is only marginally above a dumb terminal so it rarely presents a problem with emulation. It uses special control codes to clear the screen, position the cursor and perform a few other minor functions – but essentially you can treat the ADM3a as if it were a printer terminal which just happens to have a video screen.

LANTASTIC NETWORKING!

JEFF SMITH/THE IMAGE BANK

Andrew Einspruch found that networking can be inexpensive, simple, and – best of all – effective!

WE ALL KNOW that networking ia a huge commitment. It requires a dedicated server, hours of manpower, and stacks of dollars just to get in the game. And it's an expensive mistake if you make the wrong decision. Let's face it, if you only have a few PCs to hook together, it's probably not worth it. You may as well cart floppies around.

Right? Well, sort of.

Nestled between the frustrated floppy carriers and the full-blown networkers, lies a market niche for low-priced, high-performance local area networks. That's where LANtastic from Artisoft fits in. For a fraction of the cost of the big name products, you can tie your PCs together with a peer-to-peer system (that is, no dedicated server).

This is a product where you think, 'Where's the catch?' It's inexpensive, it's easy, and it works. There are, of course, some considerations, which we'll cover. But if you need a small to medium-sized network (call it 2 to 50 nodes), then take a look.

Let's start with some numbers. To hook-up an XT or AT- compatible, you need a LANtastic two-Megabit/second network adapter (cable included) at $390 (taxed), plus a multi-user license for the LANtastic Network Operating Sydney (NOS) at $360. So a six PC network, for example, comes to $2700. That's it. Want to add another workstation? Buy another card. The software is licensed per network, not per node.

'I'm very impressed with LANtastic. It's a good networking solution,' said Bill Bolton, who by night, runs three bulletin boards, and by day works for a financial institution. His three BBSs – Software Tools, OPUSinfo Under, and ALL This and OS/2 – run on an IBM AT, an Osbourne AT, an

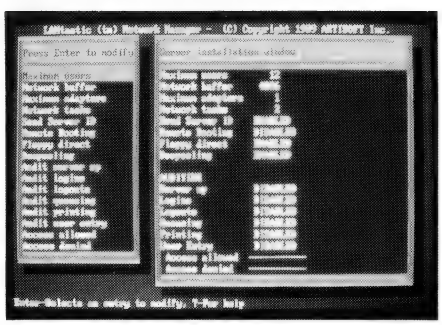
Ultra AT, and an 80386 home-brewed dedicated server, all linked by LANtastic. Bolton, who's worked with a wide range of networks, found the LAN 'really easy to install. Usually, when I set up a network, I allow a day to do so. But with LANtastic, I had the two-station starter kit up and running at a satisfactory level in an hour.

NETBIOS compatible

IF THE TWO-Megabits/sec specification is too slow, or if you have PS/2s with MCA, there's another. LANtastic NOS is a full NETBIOS-compatible system, and can theoretically run on any network adapter that correctly implements NETBIOS. A big plus for the NOS is its low memory overhead – 40K for a full-featured server, and under 12K for a workstation node. That's about a half to a quarter of the usual RAM requirements for a server.

To do this, you need the Adapter Independent NOS version, costing $600 (again, for any size network). And it's recommended you use the Adapter Independent NETBIOS ($450), which currently only supports Western Digital ten-Megabit/sec Ethernet cards ($780 for PS/2 cards and $732 for XT/AT cards). The Ethernet adapters give the network greater throughput, and let you attach PS/2s to LANtastic. This brings our six XT or AT-compatible system to $5442, or for six PS/2s, $5730.

LANtastic is not designed to compete with full-bore 3Comm or Novell networks. Anything over 50 nodes will likely require more power, despite the fact that a LANtastic network can handle up to 120 workstations. And, there's a large grey area – an installation's needs obviously depend on what kind of traffic is expected. Half a dozen people doing extensive database manipulation will tax a LAN far more than 40 people sharing the odd file and sending the occasional e-mail note.



If a network needs more than the standard 2 Megabits/sec, or if it's running PS/2s with MCA, the LANtastic NOS is a full NETBIOS-compatible system, so it can theoretically run on any network adapter that correctly implements NETBIOS.

```
** Micro Support Systems Pty Ltd LANtastic Network Power Up Sequence

LANtastic (tm) NETBIOS V1.81 - (C) Copyright 1989 ARTISOFT Inc.

Command line                IRQ=5 ADDRESS=6 VERBOSE
Node address                0001        Adapter number          0
Interrupt request           5           Adapter address         6 (D000)
Maximum number of names     16          Number of buffers       3
Default number of sessions  32          System timeout          10
Default number of NCBs      32          Machine type            AT
Local interrupt stack       DISABLED    Bytes of memory used    1584
          ---- LANtastic NETBIOS installed ----
LANtastic (tm) Redirector V2.52u - (C) Copyright 1989 ARTISOFT Inc.
          ---- LANtastic (tm) Redirector Installed ----
LANtastic (tm) Server V2.52u - (C) Copyright 1989 ARTISOFT Inc.
          ---- LANtastic (tm) Server Installed ----
LANtastic (tm) LANPUP V1.0 - Copyright (C) 1988 by ARTISOFT, Inc. Tucson, AZ
        --- LANPUP installed, Press Ctrl+Alt+L to activate ---
LANtastic (tm) Connection Manager - V2.52g (C) Copyright 1989 ARTISOFT Inc.
Machine HOST_1 is being used as a Redirector and a Server
File and record locking currently DISABLED
LPT Timeout: 0 Seconds
Available Server: \\HOST_1
Strike a key when ready . . . _
```

The peer-to-peer nature of LANtastic is particularly well-suited to small installations – under the Network Operating System (NOS), any machine on the LAN can be either a workstation or a server.

For a lot of businesses, a simpler solution is a better one. Simon Hopkinson, a playwright and director, got involved in an all too familiar computer nightmare for a relative's Sydney-based casting agency. The company brought in a 80386 PC running a multi-user database under Unix. After six months and $30,000 of hardware, software, and consultancy fees (but not including staff wages), the system was still not fully operating as promised. Two months later, the consultant in charge of the site recommended an upgrade to the tune of $15,000-worth of hardware, software, and installation. That's when they decided to re-evaluate.

'The second, third, and fourth opinions we sought, looked at our small office system and said we were crazy to be in Unix, because of the large dollars from the word 'go' to finish,' said Hopkinson. They dropped Unix, and started setting-up their database using Q&A. They also started shopping for a LAN to replace the multi-user system. 'We didn't want to spend another 30,000 bucks and find we'd made another mistake,' continued Hopkinson. 'We made a conscious decision to go for a cheaper option, so long as we knew it would work. From an economic standpoint, LANtastic was the best possibility.'

It ended up costing them about $2500 for five nodes compared to quotes they were given for around $2000 per workstation using other systems. 'To get the network going was six to seven hours work,' said Hopkinson. 'The guys who put it in had minimal experience with LANtastic, but they found it easy to install. I don't know how it works, and personally, I don't give two hoots, but it does.' While the set-up is still new, the company is happy with it: 'There is an access speed performance loss, but it's a far less intimidating and far more successful system than what we had'.

Peripheral savings

ANOTHER WHO went for LANtastic is John Luchetti, state director of the Building Industries Specialist Contractors Organisation of Australia (BISCOA), a trade group for building sub-contractors. Luchetti already had some AT-compatibles, and didn't really need the power of a dedicated server, so he was particularly attracted to the LAN's peer-to-peer feature. BISCOA provides legal advice, and, as such, had multiple versions of documents floating around on different floppies. Luchettii wanted to centralise those, decrease the number of floppies moved around, and gain edit access to his secretary's word processing files.

But those network uses, while impor-

JEFF SMITH/THE IMAGE BANK

LANtastic is not designed to compete with full-bore 3Comm or Novell networks. Anything over 50 nodes will likely require more power, despite the fact that a LANtastic network can handle up to 120 workstations. And, there's a large grey area – an installation's needs obviously depend on what kind of traffic is expected. Half a dozen people doing extensive database manipulation will tax a LAN far more than 40 people sharing the odd file and sending the occasional e-mail note.

tant, for him were not really selling points. In fact, what Luchetti needed was to share his Epson dot matrix and NEC laser printers. 'It was $3000 for LANtastic versus an intelligent print queuer at $1500 and we still would be swapping floppies,' he said. 'I thought it was silly to go into a queuer, when for a bit more, I could get a network.'

The peer-to-peer nature of LANtastic is particularly well-suited to small installations, like BISCOA's where it's financially unfeasible to buy a machine to dedicate as a server. Under the NOS, any machine on the LAN can be either a workstation, which uses resources on other machines, or a server, which also provides those resources. Nodes can switch between those modes as needed. Once the network expands to ten or 12 nodes, the installation would likely want a dedicated server machine – not because of any failing with LANtastic, but because of how networks of that size tend to be used.

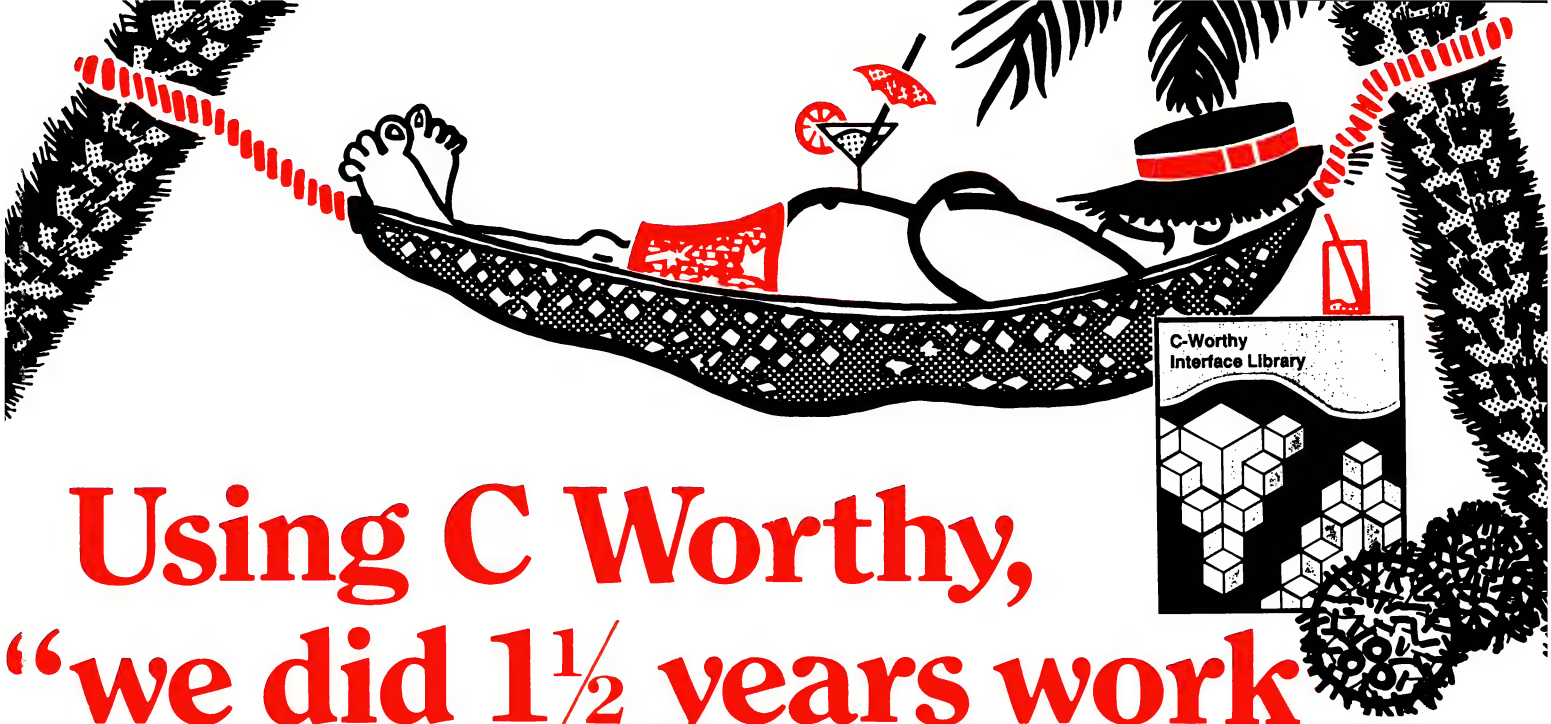
One of LANtastic's great strengths is providing a relatively painless entry into networking and an easy upgrade path. Bolton, who is considering upgrading his home LAN to Ethernet, since he needs to add a PS/2, has favourably evaluated a ten-Megabit/sec Ethernet LANtastic system for his employer. 'Everything I've been able to throw at the network, it's been able to handle.' Bolton said. At work, he needs to set-up a work group LAN to implement version control software for code development. Instead of setting-up a ten to 12 node network under the corporate standard Token Ring LAN, he's pushing for LANtastic. 'It's affordable for now, and we can re-evaluate later,' he commented. 'We can buy, install, and use NETBIOS software, and upgrade later it we need to. The low dollar input allows you to walk away from it later if you want.'

One area where functionality was sacrificed to cram the server software into 40K is electronic mail, which won't win any awards. But the company anticipates releasing an add-on mail service for those who need it. They also are set to release a package called Network Eye, which can monitor and control any workstation on the LAN and should run on any NETBIOS network. □

Product Details

Product: LANtastic
Distributor: Digital Solutions
95 Landsborough Ave, Scarborough
4020 Qld
(07) 203 4880
Price: $793 for 2-node starter kit (refer to the text for more complete pricing)

This is a product where you think, 'Where's the catch?' It's inexpensive, it's easy, and it works. . . . if you need a small to medium-sized network (call it 2 to 50 nodes), then take a look.



Using C Worthy, "we did 1½ years work in 4 months!"

-Hugh Cruickshank, Project Leader

Produce a polished, Bullet-proof application in less time than ever before with C-Worthy Interface Library.

Design your software with human factors clearly in mind and you will have a competitive edge. Use C-Worthy and you will be taking advantage of over 6 years of work by experts in human-computer interaction.

All the functions you need are together in this single, easy to use program. C-Worthy Interface Library has over 400 tight, ready to use functions that include.....

- **Screens:** screen display, restore, save, scroll, colour pallettes, and more.
- **Menus:** pop-up, Lotus style, pull-up, MS Windows style (pull-down)
- **Error Handling:** DOS, user, program
- **DOS Interface:** File handling, wildcards, date/time conversion, directory/drive management
- **Help:** system, context sensitive
- **Editing:** string, word wrap text Text messages in separate files for easy access/translation Autodetect for MDA, CGA, EGA, VGA Compatible with MS Windows
- **Windows:** tiled, pop-up, overlapping, exploding. Direct or virtual access
- **Keyboard Handling:** regular, function, interrupt, background procedures
- **Forms:** 17 field types plus user definable fields. 3 levels of data validation. Hide, lock, and secure fields. Optimal field movement. Powerful list management and display routines. Tutorial and Getting Started sections. Reference Guide includes an example for every function
- **No Royalties**
- **Not copy protected**

And because you get every aspect of user interface integrated in one package, C-Worthy Interface Library is the best library value you can find. In fact, it's the only library to provide you with everything you need.

No other user interface system puts this much total support and independent control in your hands. **$850**

For a free demonstration disk, simply attach your business card to a copy of this advertisement and send it to the Australian distributor, Software Express.

SOFTWARE Express

AUSTRALIAN DISTRIBUTOR OF C WORTHY

SYDNEY: 74 PARRAMATTA RD, STANMORE. 2048. PHONE: (02) 519 3249. FAX: (02) 519 3868
MELBOURNE: 48 A'BECKETT ST, MELBOURNE. 3000. PHONE: (03) 663 6580. FAX: (03) 663 6117

LOTUS 123R3

AN ANALYTICAL SPREADSHEET

Lotus 123 Release 3 may bring a bizarre new twist to the lawsuits which have cursed the industry in recently: the first impression is that Release 3 'looks and feels' like SuperCalc 5, according to Steve Keen.

AS WITH SUPERCALC, which was first on the market by several months, Lotus 123 Release 3 (Lotus styles it 123r3) lets you see up to three spreadsheets on-screen simultaneously, or three pages of the one 3-D spreadsheet. As with SuperCalc, Lotus has added the ability to consolidate numbers from several pages of a spreadsheet by extending its formulas to include page co-ordinates (and ranges) in addition to the standard row/cell co-ordinates. As with SuperCalc, the Insert command has been extended to allow you to insert pages in a multi-page spreadsheet, in addition to rows and columns.

The explanation for this is not that one has copied the other, but that both have made the move from two dimensions in the most obvious way (though not necessarily the best).

The points go to Lotus, convincingly. Its user interface has the great advantage of familiarity, its implementation of the three-dimensional model is more complete than SuperCalc's, and it seems to require less memory to do it.

As well as making the leap into three dimensions, 123 Release 3 adds a number of significant (and long overdue) enhancements to Lotus' aging flagship. Lotus graphs are now worthy of display in a boardroom, its database now boasts some relational powers, the 3-D concept has some useful spin-offs for performance in other areas and there are numerous minor improvements. Perhaps the main surprise

is that Lotus now runs in graphics mode, and can simultaneously display a spreadsheet and a 'live' presentation-quality graph.

Has Lotus regained the mantle of the world's best spreadsheet? Yes, but not without reservations. There are some aspects of its 2-D competitors which Lotus hasn't addressed – notably the ability of both Framework and Excel to replace co-ordinate formulas with English language formulas, and Excel's desktop publishing abilities. Another 3-D rival, SuperCalc5, beats it in some ways, notably with far superior auditing powers and much better graphics (despite considerable improvements to Lotus in that department). It also has another three-dimensional competitor which, for consolidation applications, has a better model of multi-dimensionality – Lucid 3D.

3-D models

MULTIPLE SPREADSHEETS have all sorts of uses. Consider a common usage for spreadsheets, deciding whether you can afford to buy a property despite Paul Keating's management of the economy. With a 2-D spreadsheet, you could make up a table showing how monthly payments would vary with different interest rates and repayment terms for a property costing say $250,000; with a multi-page sheet, you could also take account of spiraling land prices by increasing the price by $5000 on each sheet.

They also allow you to approach your work in a modular fashion. Rather than storing everything on the one sheet, you can break input data, formulas, output and macros onto different pages.

You can also modularise your models. A feasibility study for a new project (say, whether you should establish a new factory) normally involves many interrelated tables – establishment costs, variable costs, required loan levels, potential interest rates, expected revenue under different scenarios – all of which eventually collapse into a 'bottom line'– a payback period or a net present value calculation. On a 2-D spreadsheet, that results in numerous different tables and ranges, and extremely cumbersome, difficult to audit formulas.

With a 3-D, multi-file spreadsheet model, you can put each module – expected revenues, the loan and repayment calculations, fixed costs, variable costs – in different multi-sheet files. The final results can be consolidated on the top spreadsheet in the hierarchy. This makes it much easier to see the relations between different parts of the study, and to spot possible bugs. Each of these uses could to be as important as the main reason why users and developers have pushed for multi-dimensional models: consolidation of data.

With a 2-D spreadsheet, it's very easy to analyse problems which have only two determinants. Lotus' manual uses the example of a corporate income statement over four quarters, with the company having two stores. There's no difficulty in preparing the statement in 2-D, but you have to add the data from each store to get the final results. To keep separate details for each store you have to keep store tables somewhere else on the sheet, with formulas like +J12+Q12 providing your consolidated figures. If you add a new store, you need a third table, and you have to edit the formula to something like +J12+Q12+AC12.

The 3-D sheet handles those problems with ease. Your consolidated results appear on the first sheet. Each store occupies an identically formatted sheet behind the main one. Your summary formula is then something like @sum(B:J12..C:J12), where the B and C refer to the second and third pages in a multi-page spreadsheet.

To add an additional store, simply insert a new page between sheets B and C; the sheet labels adjust to suit, as does the consolidating formula.

The 3-D advantage is that you can now comfortably maintain separate profit and loss results for each store (or separate portfolio movement tables for each share, separate process analyses for each production line, and so on), while still being able to get the big picture. You can see where your profitability or yield is being enhanced or undermined, and still see the overall results.

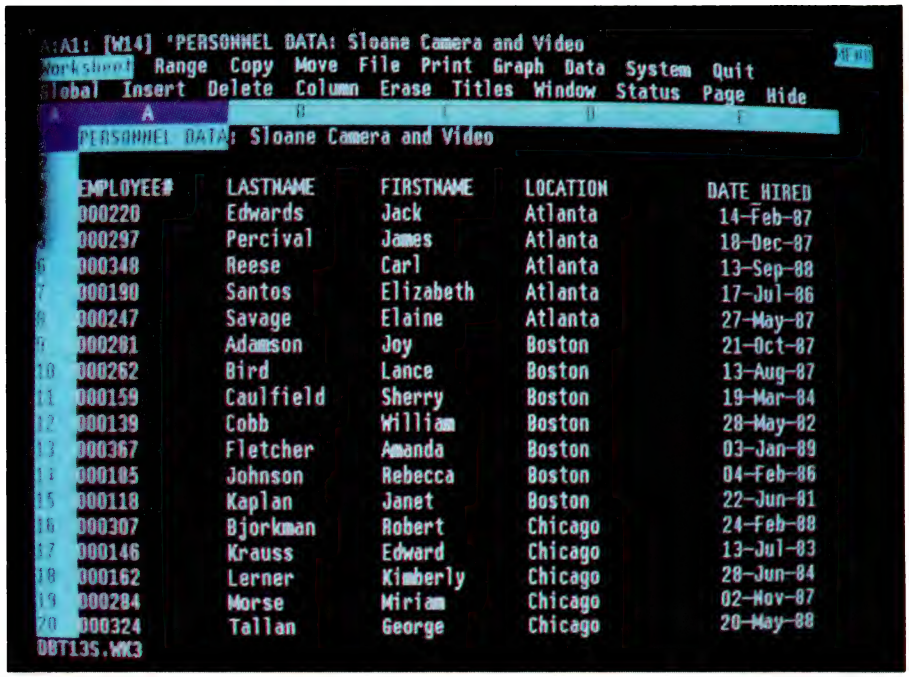
User interface

THE FAMILIAR 123 interface now has a extensions to handle three dimensions, multiple spreadsheets in memory, and additional features (new graph types, search and replace capacity, relational database facilities and so on). Additional features reside on function keys, mainly to control the newfound ability to display multiple sheets on-screen. Commands which used to work in two dimensions only – such as copy, move, range define – now work equally well in three dimensions.

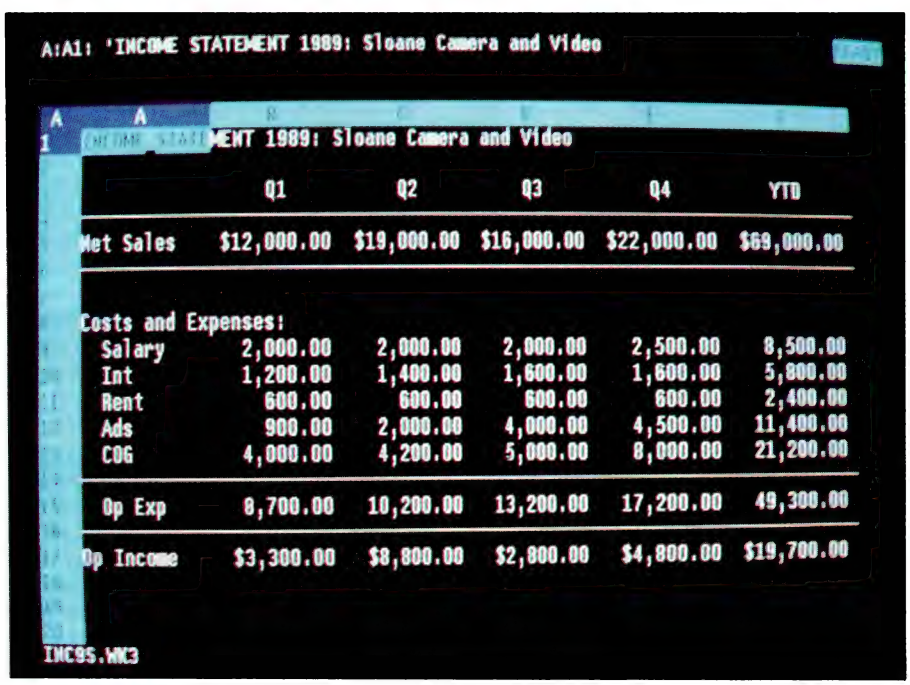
Movement commands naturally had to be enhanced, to allow for movement between 'pages' of the same file and between files. Ctrl-PgUp now moves from sheet A to sheet B in a multi-sheet file, and similar commands cover movement between separate files in memory. The insert command now has the added option of inserting one or more sheets, the delete command can likewise delete them, the file menu now has Open as well as Retrieve (to allow multiple files in memory).

The most visible change – to a user with a graphics monitor – is that 123 now runs in graphics mode. It's no Excel (all the commands are still menu rather than WIMP-based, and there is no on-screen font choice), but it is a change. The main benefit is that it allows a chart to be displayed in a window on-screen, as well as a spreadsheet. The chart is 'live', so any changes made to the data are immediately reflected in the graph.

Lotus' formulas can now handle both multi-page spreadsheets, and multi-spreadsheet formulas: a formula in one file can easily reference data in another.



The familiar 123 interface now has extensions to handle three dimensions, multiple spreadsheets in memory, new graph types, search and replace capacity, relational database facilities and a number of other enhancements; additional features reside on function keys. Movement have been enhanced to allow for movement between 'pages' of the same file and between files.



A major advance with 123 Release 3 is that it can now access an external database table – it can read external records in, append new records to an external file, perform a relational query on several external tables, create new files, delete old ones, edit records, send a command to the external database, and so on. This facility, when fully developed, will give 123 an enormous lead over other spreadsheets as an analytic tool for data stored in corporate databases.

The extension into multi-pages was easy. Each page is now identified by a letter, as is every formula. A simple equation to sum a range now becomes @sum(A:B2..A:J12), with the A prefix indicating that the range is on page A of the file. The same applies if your formula uses ranges rather than coordinates. The multi-file formula follows the same principle.

Designing a 3-D model

THE LOTUS/SUPERCALC multi-sheet approach to three dimensions forces you to design your model bottoms up. Let's say you want to keep a separate file for salespeople at each store, then consolidate that into each store's results, and finally show overall company sales. You could start with separate sheets for the salespeople at each store. Then there would be a second file with the subsidiary pages showing total results for each store (using an @SUM formula like the one above), with the top page consolidating the results.

It's easiest to work from the top down: design the final consolidated picture that you want, then the subsidiary sheets to support it. Lucid 3-D lets you do that, with a 3-D definition that goes from a cell in one sheet to one cell in another file. You start designing your application from your consolidated spreadsheet, not from the base. Once you have loaded it, you can automatically move to or create the related lower level spreadsheet just by pressing the plus key on the numeric keypad.

Also, Lucid returns to the top spreadsheet simply the contents of one cell in the linked sheet. That cell contains your consolidating formula, and if you're sensible you will leave room in that spreadsheet to allow for additional salespeople or whatever. It is also easy to add levels to your consolidated model – for example, by replacing a number showing total sales for a salesperson for a month, with a reference to a lower level sheet showing sales of each product by that salesperson for that month.

That gives Lucid the edge in consolidation problems, but it loses out in feasibility work (and the like), because you can only have a link between one cell in a spreadsheet to one cell in another.

Overall, the Lotus/SuperCalc model has the edge. Although it is not as good for consolidation, it can be turned to that task, and it has the flexibility to handle other kinds of 3-D analysis better. That doesn't mean that the multi-page spread-

CHOOSE ANY 3 PROGRAMS

FOR ONLY $19.00

Plus

FREE June'89 Collection and free membership to

CHOICE MARKETING SOFTWARE CLUB

TELEPHONE (09) 459 8894

The following software are for IBM-PC & compatible computers only.

CM100 PowerMenu- DOS Menu program with built-in file manager.

CM102 Ez-Form- create new forms or modify existing ones to suit your needs.

CM104 PC-Prompt- You will never forget the right format for entering DOS Commands again.

CM105 PC-Deskteam-9 ways to improve your PC with calculator,notepad,calendar,alarm and many more.

CM106 Word Processing for Kids-A word processing designed specially for kids.

CM107 Origami- Teaches you the Japanese art of paper folding.

CM108 Arcade Games Collection- An assortment of the finest 'Arcade type' games including Scramble and Donkey Kong.

CM109 ImagePrint-Allows you to produce letter quality print on your Epson or compatible printer.

CM110 ProComm- Communication program that allows you to go to DOS without terminating.

CM111 Sidewriter- If your report won't fit into a page, print it sideways.

CM112 PC Outline-Helps you to organise your thoughts.

CM113 PC Style-Analyses your writing to help you make your writing easier to understand.

CM117 PC-Stock Plot stock analysis graphs on monitor or printer.

CM119 Basic Games-Various games in Basic including Bowling, Keno, Spacewar and more.

CM120 Desktop Publisher-Publishing program for newsletters or simple application.

CM121 LottoPro-Analyse Lotto draw trends to give you better odds at the Lotto.

CM122 Bookkeeper- A simple bookkeeping tool for small business and personal use where complex accounting software is not required.

CM123 Poker Anyone?-Five card draw poker against the computer.

CM125 Record Collector- Professional level music cataloguing program. You find song by title, artist, label, producer and many more.

CM126 HDM III- Hard disk menu system with unlimited menus and selection.

CM128 ABC Fun Keys- For ages 2-5; learning Alphabet keyboard.

CM130 PC-Flow-A flow chart designing program.

CM133 T.O.P.- Over 40 procedures and functions for Turbo Pascal 4.

CM134 Bradford- Letter quality fonts for Epson MX and FX.

CM135 Weight Control-Assists you in dieting with info about dieting and self test.

CM136 Context & Snipix-Superimpose Graphics for use in desktop publishing.

CM137 Beginning Sound- Helps preschoolers learn to read.

CM139 Grab Plus- Automatic envelope addressing utility and address database.

CM140 Formgen- Design forms for home and office use.

CM141 Trilogy- Note storing and retrieving utilities for writers and others.

CM142 Domino- Play Dominos against the computer.

CM144 Card Track- Keep track of your credit card expenses.

CM146 Manage- Improve your management skills by evaluation questionnaires.

CM147 Automenu- Customize your computer operation with this easy to use menuing system.

CM149 As Easy As- Lotus 1-2-3 look-alike

CM150 Galaxy-a fast, ram-based word processor with lots of features and easy to use.

CM151 Medlin Accounting System- A double entry accounting program that includes A/R, A/P and G/L.

CM152 Instant Recall-Memory-resident, free-form database program with its own word processor.

CM153 Tutor-Easy to understand tutorial on your computer and its operation. Great for beginners.

CM154 PC-Art- Graphic drawing programs that let you create colour pictures.

CM155 Small-C- A C compiler that runs under DOS.

What Our Customers say:

"Once agin, compliments on the prompt execution of orders."-M.M.,Fremantle

"I would also like to pass on my thanks for what must be one of the best value software packages (service) to be found within the marketplace."-M.A., Traralgon.

"..am eagerly awaiting the July Software Selection of the Month"-D.D. Tamworth.

"I believe your organisation is one of the best (I should know, because I belong to every P.D. and User Supported group that advertises in Australian computing publications)" A.L. Castle Hill.

Choice Marketing Software Club's "Value for Money" package includes:

- 30 days Free Trial. You may examine the programs in the comfort of your own home and if not completely satisfied, return them within 30 days.Your money will be refunded.
- Free Membership. There are no annual membership renewal fees.
- Free Newsletter. Every month you will receive the club newsletter PD SOFT .The newsletter covers the software selection of the month, reviews, and the latest releases of shareware and public domain programs. You will continue to receive our newsletter as long as you remain active.
- Access to thousands of good quality software programs at the cost of $12 per disk plus $3 postage and handling charges. The cost of $12 covers duplication costs, advertising, upkeep of library, computer equipment, newsletter, and staff wages. Some of the software in the library are subject to additional registration fees payable to the author for regular usage of their program. It's a case of you pay the registration fees if you like it and use it.If not, you don't, but you may still keep the program or pass it to your friend.
- **Free Gift**- Send your coupon in before 30th September 1989 and we will send you our June'89 disk. 11 programs are compressed into this disk which includes a clip-art conversion program, computerise grocery shopping list, stock market analyst and much more.

Mail to:

FREE POST A13
CHOICE MARKETING SOFTWARE CLUB
P.O. BOX 280 MADDINGTON WA 6109

Yes! Please accept my applicaton for membership in the Choice Marketing Software Club. Send me 3 programs whose numbers I have indicated in boxes plus my FREE JUNE'89 Disk and my FREE membership, for only $19.00 plus $3.00 postages and handling(for 3.5" diskettes please add $10.00).

I wish to receive the 3 selections marked in the boxes provided:

Diskette size ☐ 5 1/4" ☐ 3 1/2"

SURNAME :_____FIRST NAME:_____

ADDRESS:_____

SUBURB :_____STATE:_____POSTCODE:_____

Enclosed please find my payment as follows: Cheque/Money Order/ or please charge to my Visa/Bankcard/Mastercard.

Card No: _ _ _ _ / _ _ _ _ / _ _ _ _ / _ _ _ _ Expiry Date:_____

SIGNATURE (If under 18 parent must sign)_____

YC 8/89

sheet is the best approach, however. Lucid would win if it was modified to allow one to many links between spreadsheets, rather than just one to one. And another kind of software altogether, the multi-dimensional database PC Express, leaves both spreadsheet models for dead, for both data consolidation and feasibility studies.

Lotus vs SuperCalc

LOTUS HAS SEVERAL features which put it well ahead of SuperCalc when it comes to working in three dimensions. All Lotus commands work transparently across three dimensions so you can create a basic template for a multi-sheet file, and copy that across all the sheets in one operation. With SuperCalc, while you can copy from one sheet to another, you can't copy across a range of sheets.

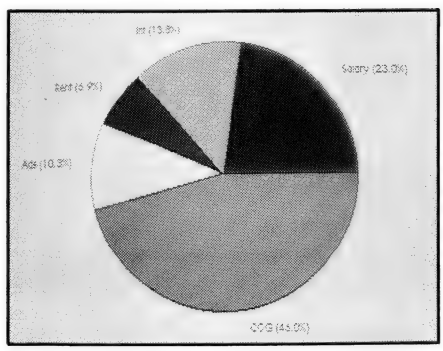
Lotus also has the Group command to ensure that any formatting commands given for the master sheet will automatically affect all subsidiary sheets. Also, as you move from sheet to sheet, you automatically remain in the same cell reference: press Ctrl-PgDn from cell G13 off sheet A, and you move to cell G13 of sheet B. That makes life much easier when each subsequent sheet is a clone of the master sheet.

The 3-D feature can be used to advantage in databases – you can now have input data in one sheet, criteria in another and output in a third. This overcomes one of my main objections to using spreadsheets as databases: the fact that you get multiple copies of your data on a sheet and you can't be sure which is the original.

The changes to Lotus's database go far beyond this, however, and give Lotus as much database processing power and more as the add-in product Silverado, produced by Computer Associates, the authors of SuperCalc.

The major advance is that 123 Release 3 can access an external database table (the beta version supported dBASE III only – and without the ability to edit records – but the implementation allows for any number of drivers; potentially 123 could access any external data format). It can read external records in, append new records to an external file, perform a relational query on several external tables, create new files, delete old ones, edit records, send a command to the external database, and so on. This facility, when fully developed, will give 123 an enormous lead over other spreadsheets as an analytic tool for data stored in corporate databases.

There are improvements in the straightforward data querying too. Formulas can be used to query data tables, rather than just straight numbers or labels; you can use formulas to aggregate values in a database (for example, a formula to extract sales for each month and aggregate them from a table containing sales across all months).



The creator of the original 123, Mitch Kapor, saw the integration of number crunching ability and graphics as 123's biggest appeal. As graphics packages evolved, that became a joke: Lotus graphs were infantile compared to what you could get out a dedicated graphics package like Harvard. While Release 3 graphs still don't meet the standard of Harvard, the comparison is no longer odious. In fact, in some departments, 123's graphing ability is superior to that of Lotus's dedicated graphics package, GraphWriter.

The biggest step forward is relational querying. You can now specify several data input ranges, and, in your criteria, specify a join formula which is essentially the same as an SQL join statement (+SALES.CUSTID = CUSTOMER.CUSTID), to join any number of tables together. Formulas can then perform operations on joined records, such as multiplying quantity sold from an invoices table by price from a product table, and decrementing credit from a customer table.

Graphics

THE OTHER BIG step for Lotus 123 is graphics. The creator the original 123, Mitch Kapor, saw the integration of number crunching ability and graphics as 123's biggest appeal. As graphics packages evolved, that became a joke: Lotus graphs were infantile compared to what you could get out a dedicated graphics package like Harvard.

Lotus Release 3 graphs still don't meet the standard of Harvard, but the comparison is no longer odious. In fact, in some departments, 123's graphing ability is superior to that of Lotus's dedicated graphics package, GraphWriter.

Lotus now supports mixed bar/line graphs and horizontal bar charts, its high/low/close graph can also show trading volume and a trend line, pie slices can be exploded or hidden, you can alter colours and patterns, and eight text styles are supported, with a range of potential text sizes. However, the actual characters used on printout are dependent upon your printer – they aren't typeset fonts as with GraphWriter or Harvard.

Nonetheless the display quality of Release 3's graphs is quite high, acceptable enough for presentation purposes. The fact that you can now display a graph in a window, and watch the graph change as the data changes, also makes Lotus graphs a useful analytic tool. However on the comparative front, SuperCalc definitely has the edge in graphics. Its charts are of a higher quality, the interface for graphics design is much easier to drive than Lotus' (and it differs from SuperCalc's standard menu system), there is direct control over fonts and sizes, with a genuine range of font types, a wider range of graphs are supported (including true 3D bars).

Auditing is the only area apart from graphics where SuperCalc outguns Lotus. Like SuperCalc, Lotus supports a 'map' of your spreadsheet, showing formulas, labels and numbers. However SuperCalc's system actually shows families of replicated formulas with different labels, which is a great assistance; Lotus only shows that a cell contains a formula, a number, or a label.

Lucid is likewise ahead here. Lucid's auditing includes the ability to show the entire hierarchy of files which contribute to a top level spreadsheet.

However, none of these approach the auditing powers of Excel, Framework or PFS:Plan, all of which can use English language formulas rather than coordinate formulas, making it much easier to work out what a particular formula is intended to achieve.

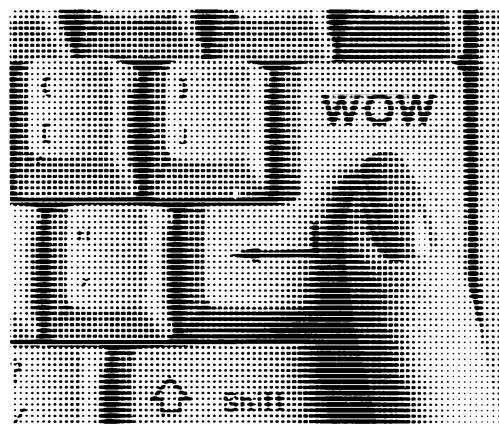
Documentation

THE 123 RELEASE 3 documentation is very clear, even in beta form. I'd rate it as the best manual Lotus has produced (certainly better than its manual for Agenda).

Word5. More than *perfect.*

These days being perfect isn't enough.

You've got to go one step further. And that's exactly what Microsoft has done with Word5. You see Word5 is the most advanced text based word processor on the market today.



In fact, Word5 has an interface so advanced it's unmatched in terms of how simple it is to use and how fast it is to act. In other words when you tell Word5 to link graphics, spreadsheets, or pieces of other documents, to organise your tabs and then show you the finished document before you print, it does it.

Word5 also gets you out of any sticky situation. You see all the menus have our "help" feature linked to them plus Word5 gives you 90 training lessons within the programme itself. That means it's actually difficult to get into trouble in the first place.

Of course Word5 has many more innovative applications: built-in mouse and network support, expanded memory support, and support for OS/2.

All unique to Word5. However it's not nearly as much fun reading about Word5 as using it. Which is why we suggest you call us on (02) 452 0222 or fax (02) 452 4387 for more information or for your nearest dealer's name.

Word5. Naturally it's more than perfect – it's from Microsoft.

Microsoft® Word5.

Making it all make sense.

System requirements – Word5: 512K memory recommended (384K available memory required) DOS2.2 or higher or OS2 Systems 1.2 or higher 2 double sided disk drives or 1 double sided disk drive and a hard disk. Microsoft and Word5 are registered trademarks.

A hard drive PC with the "works" for $2499.

If you've been waiting to buy a computer, now's your big chance.

The Amstrad PC 2086 is a 'full spec' PC with 640 K RAM as standard, operates at 8MHz with 30Mb hard disk. It's fully configured and has parallel and serial ports, a clock card, mouse, AT-style keyboard, DOS 3.3, GW Basic, 720 K 3½" floppy disk drive, and a VGA compatible high res mono monitor. (VGA colour option available from $300.)

But that's just the start. You also get Microsoft 'Works', a fully integrated business software package with word processing, spell checker, data base, spread sheet, charting and communications.

Then there's Microsoft 'Windows'. A mouse-driven operating system which lets you use different programmes at the same time.

On top of all this you also get a training course at a leading business college (in all mainland state capitals) and a voucher worth $50 off any Amstrad printer.

In short, everything you need to get you up and going.

So clip the coupon, phone the Amstrad hotline (02) 331 4808 or hurry to your nearest participating Amstrad dealer.

This offer ends soon. And if our limited stocks run out, maybe even sooner.

Please send me further information on the Amstrad PC 2086.
Send to: Amstrad Pty Ltd,
PO Box 615, Kings Cross, NSW 2011.

Name _____
Position _____
Company _____
Address _____
_____
Postcode _____ Tel. _____

AMSTRAD

For the price you get the works.

AC053

All prices quoted are RRP at time of print including mono monitor, base range and subject to change without notice. IBM is the registered trademark of IBM. Microsoft and the Microsoft logo are registered trademarks of Microsoft corporation. 'Windows' requires a hard drive for optimum use. Amstrad name and logo are trademarks of Amstrad PLC © 1989 Amstrad Pty. Ltd.

It explains the concepts behind 3-D sheets and the uses to which they can be put very clearly (again, better than the Agenda manual explains its key concepts).

There are a large number of small but useful improvements in the new package. If a formula or text entry takes up more than one screen line, the input region grows to display it all when editing. There is an automatic formatting mode, which will give numbers currency format if you enter a preceding $ sign, for example. Dates and times are now handled as a format type, rather than needing a conversion formula. 123 can handle multiple ranges for printing, data queries and statistics. The full list would take several pages to document.

Summing-up

I WAS NOT a fan of previous releases of 123; my preferred spreadsheet was Framework. But with Release 3, that has changed even though compared to the competition, it remains deficient in formatting of final output (Excel), the absence of English language formulas (Framework and Excel), true presentation-quality graphics (SuperCalc and PFS:Plan), and data consolidation within the 3D model (Lucid).

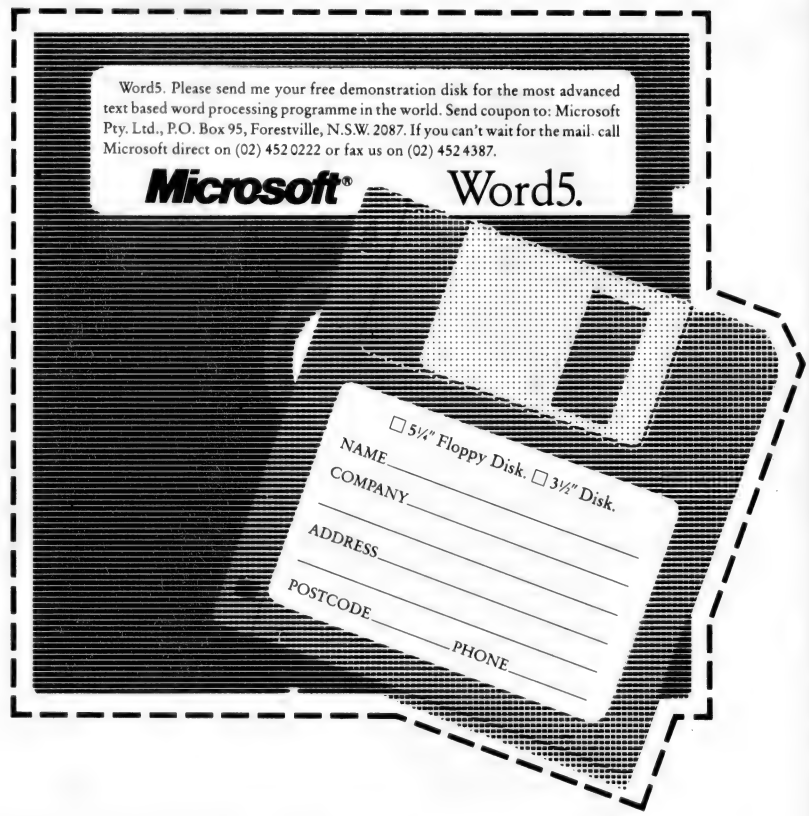
But, except for data consolidation, Lotus wins hands down where 3D analysis matters – and most spreadsheet users will find that means most analysis – and where analysis of information stored in database tables is important, another major area. For many years, Lotus has dominated the spreadsheet market through customer inertia alone. Now it will dominate the market through quality as well, although companies which want to do really heavy duty data consolidation, forecasting and feasibility work had better look at PC Express instead. □

Product Details

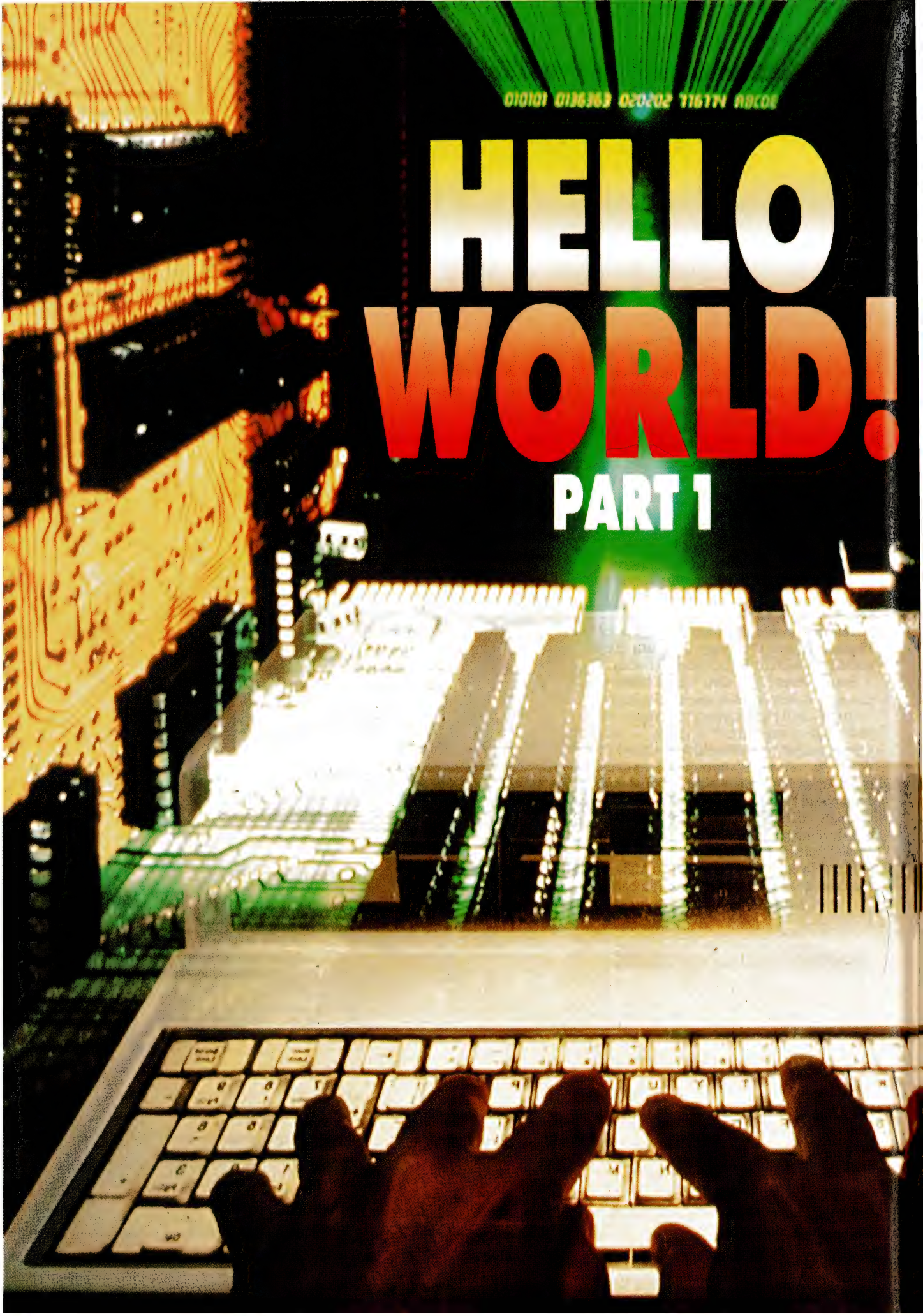
Product: Lotus 123r3
Distributor:
(02) 697 8666
Price: $855
$55 upgrade from 2.01 or later, purchased after Sept.1, 1988
$260 for 2.01 or earlier, purchased before Sept.1, 1988

As well as making the leap into three dimensions, 123 Release 3 adds a number of significant (and long overdue) enhancements to Lotus' aging flagship.

A more than *perfect* freebie.



Microsoft and Word5 are registered trademarks. MST54/89



HELLO WORLD!

PART 1

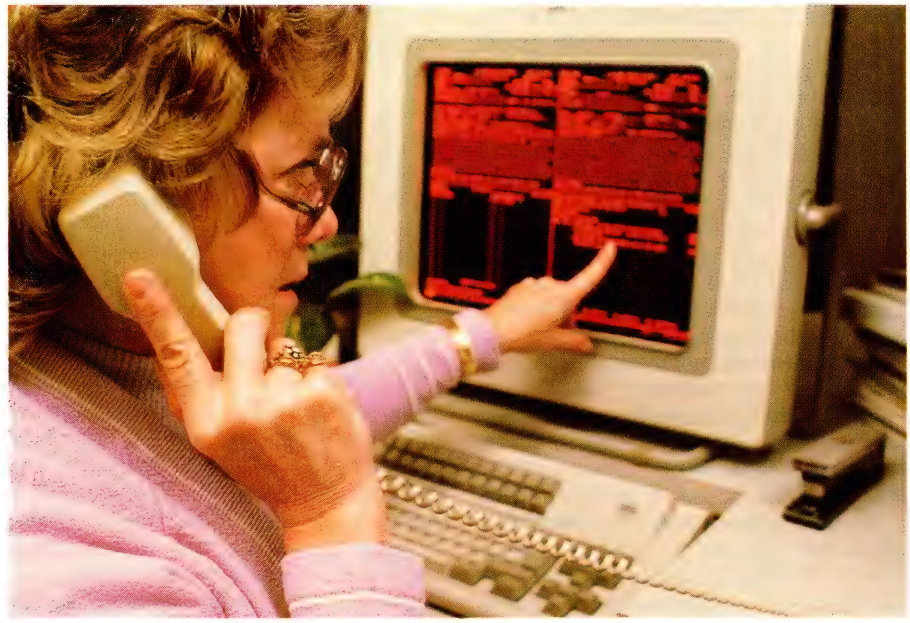
There are over 20 different ways to send 'electronic mail' but only several million active users in the world – why? The problem is too many choices, technological complexity and information overload – but we are about to see a communications revolution. In the first of a new series, Stewart Fist and Jillian Hamilton report on the present and future of electronic messaging. . .

ELECTRONIC MAIL HAS been around almost as long as computers if you accept the current definition of the term 'electronic-mail.' If you don't, then e-mail has been around much longer, and you'd probably date it from the time of Samuel Morse of Morse Code fame whose first public message (on May 24, 1844, appropriately 'What hath God Wrought') travelled the 40 miles from Baltimore to Washington DC to the delight of the US government. This was the first step towards American domination of world communications.

Morse, being an American and funded by Congress, got the credit as the inventor of telegraphy, but he borrowed the idea of messaging by electrical means (as distinct from heliographs and semaphores) from the British inventors Wheatstone and Cooke (circa 1839), who borrowed it in turn, from a host of tinkerers and inventors, stretching back to a Scot named Charles Marshall who first proposed the idea in *Scots Magazine* – which gives you a starting date of about 1753 for the theory, if not the practice.

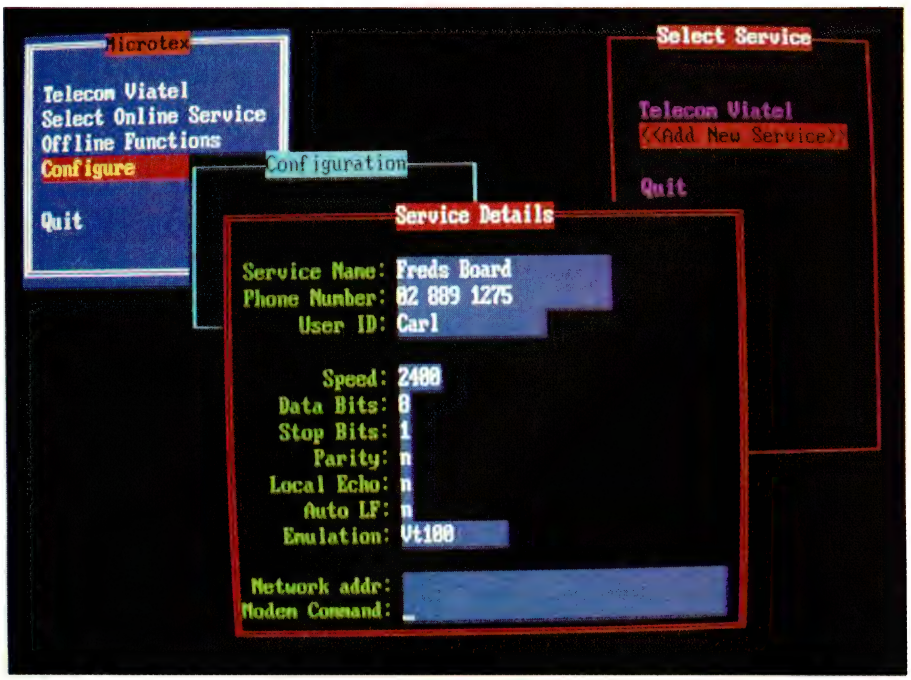
'OK!' I hear you cry. 'Electronic mail is older than European settlement in Australia. So where is it now? Why don't I see the local post office becoming a computerised data exchange?' Which is the $64,000 question. Or, more likely, the $64 billion problem. If you ring around a number of small and large companies in Australia, you'll find that the use of e-mail use is extraordinarily polarised. Public e-mail (Telecom's Keylink and OTC's Dialcom) is nowhere; it hardly figures as a corporate communications tool – although there are some organisations, like Tandy Electronics, who virtually run their business through these system.

'We do all our correspondence, place all



MICHAEL MELFORD/THE IMAGE BANK

Voice mail, touch screen messages, hand-writing tablets and facsimile are all potential sources of messages in the X.400 Message Handling Systems.



We now have telephone and Telex systems, teletex and EDI, ET, voice mail, Groups 2, 3, and 4 facsimile, Viatel and international videotex, information services with in-built messaging systems, LANs, InterLANs, WANs and MANs: no wonder there's confusion!

our orders, communicate between stores, and read the company bulletin board through Keylink,' says Chatswood store manager, Leon Balayan. 'Electronic mail is by far the best way for us to communicate – we would go on-line twice a day, and more often if we need to place special orders. And if we are looking for an unusual item of stock, we can reach nearly 400 Tandy stores Australia-wide.'

Tandy were fortunate in needing almost no capital outlay to get their e-mail system up and running, since computers and modems are standard stock items in their stores. They also have a particularly computer-literate workforce who wouldn't be fazed by random communications problems and the eccentricities of the system.

At the other end of the e-mail spectrum is insurance company MLC, which set-up internal e-mail through their IBM mainframe, but 'no longer believes in it,' according to spokesman Ian Dundas. 'E-mail needs the constant support of technical staff, because people are always forgetting how to use its features,' he explains. 'We had to have someone constantly on the phone explaining how to use the system – again, and again. Eventually only the communications systems staff end up using it.'

MLC have turned instead to facsimile, but this too has its problems. Many CEOs and office managers complain that too much time is spent on the layout of fax messages. Fax becomes too expensive for the casual and social uses it invites, and already we are beginning to see a flood of junk fax mail.

Telex, fax and e-mail

AT PRESENT, the three major electronic messaging technologies around the world are Telex, facsimile and e-mail. Telex and facsimile share the basic advantage of reproducing their messages on paper; you can feel pretty confident that these messages will be delivered and bought to the attention of the messagee (to coin a term where one is desperately needed).

On the other hand Telex is for print-characters only, and the upgraded service called teletex (also a CCITT world standard) has never really got off the ground, and probably never will. However Telex and teletex have a degree of legal standing for contracts, orders and the like, which the other services don't offer – although facsimile would certainly carry a lot of weight if it was signed and on company stationary (and if it didn't fade to oblivion before the court case).

At the present moment you would characterise e-mail as primarily an in-house (work-group) memo system for groups of people who constantly exchange information and regularly access their electronic mail boxes.

So facsimile and Telex easily head the list of substantial messaging services if we discount telephone traffic. But can we? Voice-mail is now a reality in many companies, and there will soon be public-access voice-mail systems, just like Keylink and Dialcom. Voice-mail doesn't need a terminal and you can send and receive messages from almost any location including intra-national flights, trains and cars with the advent of cellular radio.

The problem is that voice mail is even more limited than Telex, and there's no permanent paper record, no memory jogger, and no legal standing. So what about videotex, or EDI, or the international hacker's FIDO system?

When you stand back and look at the spectrum of communications systems now on offer, you begin to get a panoramic picture of the problem. For all you afficionados of Ronnie Barker's 'Open All Hours,' we are rapidly coming under the influence of the 'Mavis syndrome' – the problem of too many choices, technological complexity, and information overload. It leads most people inevitably to the choice of the simple, the reliable, and the familiar – like Telex and the telephone.

Will my Group 3 fax talk to his Group 2? Do I access Keylink with seven bits, one stop bit and no parity, or is that Dialcom? Is Dialog's direct X.121 address 316026447182 or is this the way in to their system only through Telenet? Did I get all those numbers right when I dialed? What does it mean when the Data Access computer sends me a 'CLR RPE Error 75' message, for God sake? ('Remote non-zero facility length procedure error' - if you must know!)

Historically, we've still got the old telephone and Telex systems which remain our standby, but to this basic simplicity we've now added public and private electronic mail, teletex and Electronic Data Interchange (EDI), Electronic Fund Transfer (EFT), voice mail, Groups 2, 3, and 4 facsimile, Viatel and international videotex, on-line databases, information services with in-built messaging systems, bulletin boards, FIDO, private and public packet-switching networks, computer-to-computer communications, digital PABXs and LANs, InterLANs, WANs and MANs... just to name a few of the better known.

Is it any wonder that I find the most convenient way to send this copy to YC Editor, Jake Kennedy, is by mailing him a 3½ inch floppy disk in an envelope! Imagine what it would be like if we had 33 ways of sending (paper) mail, each mutually exclusive, and each subscribed to by only a small percentage of the population. And you could only read these messages with special equipment configured in special ways.

If you add up the 13 top public-access e-mail systems used around the world, you'll still only find about 1.5 million registered users, and probably only 5 percent of these users check their electronic mailbox regularly. Telex, by comparison, has about the same number of registered users (in this case, companies, rather than individuals), but the vast majority of Telex machines are active on a daily basis – some almost constantly. This says something about e-mail, as does the enormous boost in fax sales around the world!

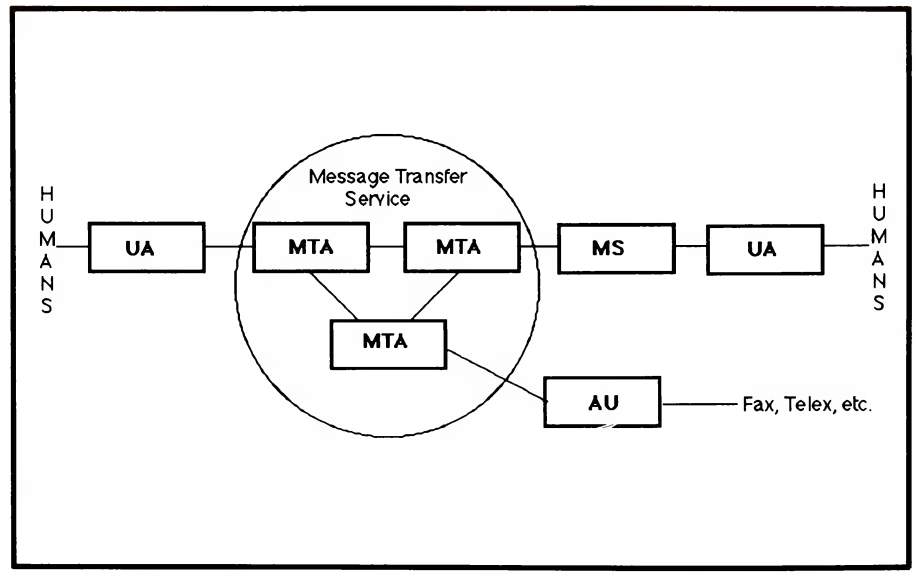


Figure 1. The computer used to construct an X.400 message is the User Agent (UA) which transmits it to the Message Transfer Service (MTS) – a chain of interlinked computers with special software. The relay process uses 'packets' which consist of two parts – the electronic 'envelope' with the addressing and status information, and the 'contents.' Message Transfer Agencies (MTAs) read the header on an incoming message, store the packet temporarily and then dispatch it. When the message arrives at its destination, it is held in the appropriate mail-box in a Message Store (MS) computer awaiting the recipient's log-on through his UA. The last MTA in the chain might check the envelope and discover that the message is to be delivered to a Telex or facsimile machine – it will then pass the packet to a local AU rather than to an MS.

X.400 and X.500

WELL, ALL THAT'S about to change; we are only a wand-wave away from a miraculous transformation. The magical words you need to utter as you stir the cauldron of your discontent, is the incantation 'X.400' (said seven times while facing East) followed by three loud 'X.500s' (to the North) then a couple of quick 'EDIs' before the orgy begins. These are the three key ingredients in the witches brew of tomorrow's electronic messaging.

Behind our naive faith in the technological future is knowledge that the Melbourne plenary session of the Consultative Committee for International Telephony and Telegraphy (CCITT), at the end of last year, approved enough of the proposed X.400 standards for an international Message Handling System (MHS) to finally make electronic mail work globally. At the same time, the CCITT approved draft standards for the X.500 International Directory system – although there's more work to be done here.

And if you think X.500 is nothing more important than an electronic name list, you're very much mistaken. When your fingers can do the walking internationally, you've got to take into account that there are 5 billion people out there, plus a few billion organisations, each with hundreds or thousands of staff/employees known both by names and titles (that may change monthly). Within each corporation there are departments, and divisions split over many locations, and within these subsections are computers and machines that may need to be accessed directly.

This is why the X.500 standard still isn't finalised; they are trying to construct a comprehensive schema for building international direct-access directories of 'objects' – and 'objects' in this terminology will include people, companies, locations, departments, titular positions, computers, computer services and even peripherals.

Any keyboard-literate coyote should be able to find the e-mail, postal, telex or even home address of the Marketing Manager of Acme Ltd, Arizona Branch, USA without leaving his keyboard. Wiley E. Coyote should be able to find the manager's business and home telephone numbers (plus extensions), his fax number and his voice-mail box, or Wiley might direct his computer output directly to the manager's laser printer or local area network. It should be faster than the Road Runner.

He should also be able to find the manager by name as well as title, and if the slob is out on the golf course, Wiley should be able to contact his paging service or cellular telephone direct. This doesn't mean that he has got to plod through extended list of branching directories to dial the connection, the directory will take care of this for him.

Imagine the complexity of a directory service for a few billion records of this detail; it is very ambitious stuff. When it comes later this year, X.500 will be stunningly brilliant by present standards, and since it is open-ended for major enhancements in the future, it can only get better.

EDI

RUNNING PARALLEL, but on a separate track to X.400 and X.500, is the race to implement a world-wide standard for Electronic Document Interchange (EDI) which will probably be carried as a feature-service over the new global X.400 Message Handling System. EDI holds more promise for introducing the 'paperless office' (Stop laughing at the back!) than any other electronic technology. And, after years of waiting, electronic document transfer systems are, this year, beginning to make a major impact.

The foundations of all these quite revolutionary changes rest on the X.400 standard, so it's worth having a closer look at

X.400 specification

THE FINAL X.400 specification is still some time in the future. But don't despair; you'll have a world-wide message handling system this year following the 1988 agreements, and it will be based on the following:

□ The system will allow the use of a wide variety of transport media – dial-up and leased telephone lines, public and private X.25 packet-switching systems, any form of local area network or internet, and digital PABXs or analogue switchboards with a modem.

□ The X.400 specification doesn't attempt to standardise the user interface. So the way you create messages, display or print them, or log and store them will be a matter between you and your software-maker.

□ The key to X.400 lies in the distinction between the electronic envelope and the message contents. This means that the contents could, themselves, be part of another messaging system with its own envelope, or it might use an entirely different technology. X.400 doesn't care. In other words, you can 'nest' message packets within the X.400 MHS, and these will be transported transparently to the other end.

□ The whole process works on a store-and-forward network, but it can carry any form of office document, telex, teletex, digitised voice mail, EFT, music or image files. It doesn't care what it carries as long as the electronic envelope tells it where to go and what to do with the message (or how to handle the transformation to another system) at the other end.

□ The system will have an open-ended address format which will allow access to existing e-mail systems, telex, fax, and people who can only be contacted through the local postal service. Think about these implications! With the range of equipment in use at present, you need to be able to address someone through a computer's alphanumeric keyboard, but also via the 12-number keypad on a fax machine. This is part of the significance of X.500 directories.

□ Messages can be tailored to suit the recipients. You can send e-mail and they will receive fax, or you can send an urgent voice-mail message and instruct their local paging system to beep them on the golf-course. If they aren't contactable, you can make sure that the message is referred to the appropriate business associate and you can check his 'security clearance' first.

□ You can ask for confirmation that all of the above was done, and that the message was read by the person for whom it was intended. In turn, they can check that you are who-you-say you are. The MHS will provide end-to-end security up to KGB-proof level.

what the CCITT have been up to all this time. Their Special Rapporteur Group on Message Handling Services (Study Group VII/Question 5) started working on this standard back in 1980 and they've been hard at it ever since.

There has been so much clever design work put into X.400 that it has now resoundingly beaten all challengers; specifically IBM's DIA/DCA, the US National Bureau of Standards FIPS 98, and a few 'standards' initially promoted by the OSI, European Computer Machinery Association and the US military – so the CCITT must be doing something right.

In fact they've incorporated most of the best ideas into this one surviving standard, which is one of the reasons why the process has taken so long. And it's also the reason why virtually every computer manufacturer, major software house, value-added service provider and government and private organisation with an interest in electronic messaging now strongly support X.400. We've never seen the international industry so coherent in their approach a new world standard.

Let's get some terminology clear. X.400 is not synonymous with electronic mail – in the same way that cars aren't synonymous with roads. E-mail is simply one type of message service that can be carried over interlinking communications networks based on computers which will use the common X.400 protocols to exchange messages and understand each other's commands.

Message Handling System

THE CCITT PAPERS talk of this web of global interconnecting computers as our new international Message Handling Service (MHS) and this is probably the best term to use because it encompasses e-mail, Telex, teletex, facsimile, EDI, EFT and the like; the same systems can be used for computer conferencing, on-line database interrogation and computer file transfer. It doesn't include 'real-time' communications systems like telephone and video feeds, nor does it supersede other store-and-forward and package-switching systems like X.25.

You can see that they've actually aimed at creating a communications pipeline network – within limits it doesn't matter what you put in at one end, it will pour out at the other – maybe late (within seconds) but it will be there. However, there's more to X.400 than just transporting data – just as there's more to X.500 than a list of names – and we'll get further into this next month.

E-mail is simply one type of message service that can be carried over interlinking communications networks based on computers which will use the common X:400 protocols to exchange messages and understand each other's commands.

At the present time we've got to accept that there are 'X.400 services' and 'X.400 services'. When any company claims to have implemented X.400, you've got to ask 'Which implementation?' and 'How far have you gone?' This is an evolving standard, so companies that built X.400 into their software after the preliminary CCITT agreement in 1984 have got to put their heads down again and implement the standards as they apply in 1988. And this won't be the last time they make changes.

CCITT committees are still working on some data security aspects of the standards – specifically public-key encryption techniques which are essential to the acceptance of X.400 in sensitive areas of business and government and for Electronic Funds Transfer and Electronic Document Interchange.

X.500 is still in its early stages also, and this directory service is vital if we are to get the most out of our Message Handling Service because the directory holds the key to 'validation' of messages – proof that a message was sent and/or received; proof that the 'messagor' was who it claimed to be, and that the 'messagee' signified acceptance of conditions or receipt of the message. We are going a long way past the simple sending of memos here – right up to national security messaging (of the NATO kind) and the electronic transfer of large sums of money.

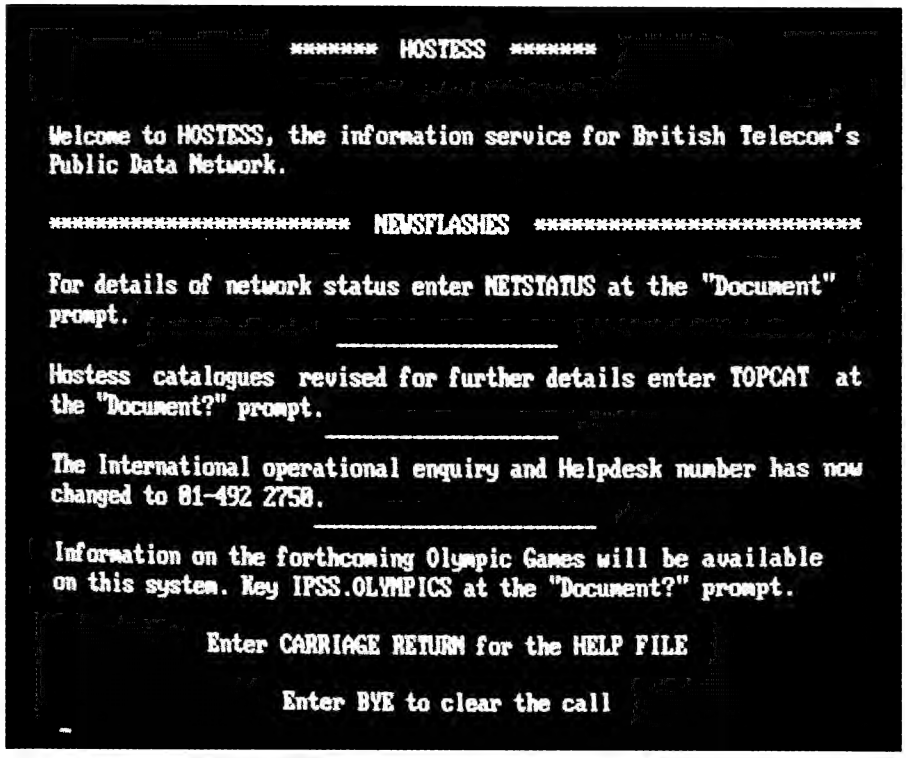
X.400 MHS

TO GET X.400 INTO context we've got to distinguish between our real-time communications systems like the telephone, Telex and facsimile which operate by making a direct circuit-switched connection to the other party to deal with them instantly on a bit-by-bit basis, and those features which characterise our present and future Computer-Based Messaging Systems (CBMS).

Voice mail, touch screen messages, hand-writing tablets and facsimile are all potential sources of messages in the broader sense of the term used in X.400 Messaging Handling Services (MHS). And, while store-and-forward text, and the ability to broadcast memos, are both basic functions of an electronic mail system, they are by no means the only desirable features.

Simplicity is going to be the key to future X.400 MHS. We will have one access point, one communications program,set-up, one very simple applications interface – and this should let us send memos, long formatted-WP, SS, or DB files, graphics, prepared Postscript page-layouts for a typesetter, or music files (up to CD standard), without any further human intervention. We should also be able to conduct interactive on-line information retrieval sessions with any public or private database, or involve ourselves in computer conferencing, or use the system as a bulletin board. This will be *the* universal, simple-to-use messaging system.

Security has a very high priority because we will want to send money (EFT) and business documents (EDI) electronically. Then there's 'priority;' we want urgent messages put on the top of the pile – and we don't want messages languishing in electronic mail boxes, unread, for weeks. X.400 messages can contain an expiry date, and if they aren't read by then you will be automatically notified. You can also arrange for a telephone or beeper alarm to be sent to alert the recipient that your message awaits.



While systems like Telecom's Viatel and the British Hostess can provide a large range of services, the technology – which is easy enough for most users to master – has limited it's flexibility to the point that they have never really taken off.

Reliability (guaranteed delivery) goes hand in hand with security and priority; if we send a message, we must have confirmation that *a)* it arrived, and *b)* was read and *c)* was read by the right person! The basic (*a* and *b*) confirmation processes are automatic and highly secure, so the system will also give your messages sufficient legal standing for important business transactions, such as contracts and orders. With the combined X.400 and X.500 services, you can prove in court that that the right person received your quote and initiated a legitimate electronic order – it is all to do with public-key encryption techniques.

International directory services are also necessary and, in fact, these are central to the question of reliability and security. We must be able to find anyone, anywhere in the world, under their name, job-title, company/branch, home address, or just their old fax or Telex number – and if they are on holidays, have the message automatically transferred to an authorised associate. Both these transfer 'authorities' and some parts of the public-key encryption system codes are also held in the directory structure, although they won't necessarily be available on screen to the message sender.

We also need an international yellow-pages ('Find me a lawyer in Tuscon, Arizona'). What is more, when we find the person/company listed, we don't want to have to key-in some 37-odd character address (and make the occasional mistake): the X.400/X.500 link will let the directory handle the addressing process and also the transmission of the encryption codes that establish identity, and anything else necessary for security and reliability.

And we've got to make allowances for a gradual change over – revolutions in telecommunications don't happen overnight. So for a time, we may have to used mixed addressing systems – some of which are the present e-mail 'aliases,' some which are just Telex numbers (with answer-back), some fax numbers, and some which are the standard X.121 address used by packet-switching networks worldwide at present. The protocols provide for all of

Future directions

IN THE SHORT-TERM X.400 will become the standard for the exchange of messages and files between competing public access e-mail services (as between Telecom's Keylink and OTC's Dialcom), and this will soon encompass corporate electronic mail systems on company mainframes, and then spread internationally. The X.400 standard differentiates between ADMDs (Administrative Management Domains – public access services) and PDMD (Private Management Domains – company/private services) but it incorporates these private systems into the message transfer network, and treats them simply as an extension of the local ADMD.

The new standard will also provide us with a simple, foolproof way of sending files between personal computers that aren't already linked into a digital PABX network or a LAN. In the longer term, X.400 will give us simple communications between PCs and remote mainframe systems, and provide two-way cross-links to facsimile, Telex, teletex, EDI and EFT, synthesised voice-mail, and even to radio-paging systems. Most of these translation standards are already in place, and some translators are already available.

For long-hauls, most X.400 messaging systems will use existing packet-switching networks – but they will use them transparently, so you won't be aware of the fact. The transport of messages over satellites, microwaves or packet-switching networks is a design decision which has nothing to do with the X.400 standard.

OTC are already looking at both voice-mail and store-and-forward facsimile, now that the X.400 standards are in place, and Telecom have already announced their X.400 version of Keylink, and their connections to the Japanese KDD e-mail system which has used the early version of X.400 for a number of years. In a few years we will have a true international messaging system which will consist of a network of intelligent computer 'nodes,' much like the existing X.25 global packet-system service available now through Austpac and Data Access.

CCITT committee members are still working on further additions to the basic envelope format will eventually allow you to specify which type of EDI you are using (American or European), and provide special message handling details such as instructions to radio-page the recipient.

these and the MHS design makes provision for sending a 'probe,' which is an envelope without contents, to check out these addresses. The probe has automatic delivery notification so that you know when you hit the target.

This all seems to be 'pigs will fly' stuff, especially as we haven't seen true X.400 in Australia yet. But this is the stage that the X.400 protocols (for the Message Handling System) and the parallel X.500 protocols (for an International Directory Service) are at now, and they'll be implemented this year. The CCITT and ISO have designed a single Message Handling Service that will do all of the above, and more. I kid you not!

User Agent

THE COMPUTER YOU use to construct your message is called a User Agent (UA) in this complex terminology (see Figure 1) and it transmits your message to the Message Transfer Service (MTS) which is nothing more than a chain of interlinked computers with special software, owned usually by Telecom, OTC, Telenet, or British Telecom, but also including private e-mail computer systems.

The relay process uses 'packets' (discrete entities of data) which consist of two parts – the electronic 'envelope' with the addressing and status information, and the 'contents.' Message Transfer Agencies (MTAs) are computer nodes in the system, which might be local or international in scope, and they read the header on an incoming message envelope, store the packet temporarily, then dispatch it on its way to the next node.

Finally (say, in half a second) the message will arrive at its addressed destination, and if this is a normal e-mail message it will be held in the appropriate electronic mail-box in a Message Store (MS) computer awaiting the recipient's log-on through his UA.

There's nothing significant about all this. It is roughly how e-mail and packet-switching systems work at present, but with X.400 there is one very significant variation on this basic process. The last MTA in the chain might check the envelope and discover that you have given instructions that the message be delivered to a Telex or facsimile machine. In these cases it will pass the packet to a local Access Unit (AU) rather than to a Message Store (MS).

Perhaps you are working from home today – then you should be able to leave a diversion message in your MS mailbox so incoming urgent mail (say, 'Priority 1' only) is diverted to your home fax machine. Other alternatives have also been foreseen: a message may perhaps be diverted to a local post-office for hand delivery; or alternatively a radio-paging command on the envelope might be directed to the paging company so that they can tell the recipient to pick the message up.

The Access Unit handles the translation to fax, Telex or teletex format. It will then initiate telephone contact and transmit the message as appropriate. In the future it will be possible for a text-terminal user to send messages to someone with a phone only, since a number of companies are working on text-to-synthesised-voice conversions. Voice-to-voice messaging using the same store-and-forward MHS should be possible very shortly, and Voice-to-text in the next decade.

X.400 protocols

THESE PROCESSES ARE only possible because the CCITT have tightly defined how the message's electronic 'envelope' is to be constructed, and standardised how the MTA, MS and AU computers will read and react to instructions carried in this envelope.

There are four major protocols within X.400 –

- P1 specifies how two MTAs handle the relaying of messages as it travels over the MHS. This makes it a truly 'international' system extending even into company mainframe computers.
- P2 is the format-specification which states how Inter-Personal Messages (IPMs) are to be structured for submission, transfer, delivery and retrieval from store. This is the specific 'electronic-mail' design protocol.
- P3 specifies a request/reply procedure with addresses and security passwords, and it defines the actions of UAs and the Access Units. This is to do with reliability, security and the translation from one format to another.
- P7 specifies the way in which your UA acts with the Message Store. This deals with the likes of filing procedures and automatic replies.

HELLO WORLD

This Inter-Personal Messaging (IPM) service described in the P2 protocol, is little more than a confusing name for what we would, at present, call 'electronic mail' – and it is important not to confuse this with the Message Handling Service (MHS) as a whole, or the other services that the MHS can carry. Inter-personal messaging uses the MHS, but it is restricted to person-to-person communications, while the MHS will also carry machine-to-machine and machine-to-person messages. The MHS has been designed to handle things like remote meter reading and home security systems also.

While the theory of electronic messaging dates back to 1753, the practice began with Wheatstone and Cooke about 1839 – so why don't we see a much more developed system?

The P2 protocol defines things like the fields in the message header which correspond to the TO, FROM, CC (Carbon Copy), and SUBJECT fields in standard e-mail services. It goes much further than this however; for instance, you can specify an Expiry Date, and you can chain messages together so that new messages are related to older ones in the electronic files ('This is a reply to Message # xxxx' type links).

The X.400 standard makes a very clear distinction between the 'envelope' and the 'contents' of the message. Store-and-

SOFTWARE
WITH MORE FEATURES
ONLY $9 EACH!

We select and add only the **BEST** to our Public Domain and Shareware Software Library, so you get **ONLY** the best software.

To our members who join we send:

- Our "Extra Super Soft" magazine on a regular basis reviewing the newest and latest programs.
- Make available many special offers e.g Free-Soft diskette offer of $6 • Provide a HOTLINE service • Supply a library with 100's of programs to select from • 1 year disk replacement guarantee for the same disk even if you make a mistake and wipe out the program.

MOST IMPORTANTLY our programs are so user friendly that you only have to type the one word, AUTO to operate any program. That's a lot of extra's from a library renowned for its add on services.

SPECIAL OFFER 6 DISKS $39.00
Includes 1 year membership

#0130 PERSONAL FINANCE MANAGER — Cheque account record & investments.
#0180 PC TUTOR — PC tutorial and DOS.
#1032 GALAXY — Multi window super wordprocessor.
#1031 MACK'S DOMINO — Audio and color Video domino game.
#1033/4 PC-FASTYPE DISKS 1 & 2 —Typing tutor.
#1044/5/6 FAMILY HISTORY SYSTEM DISKS 1, 2 AND 3 — Trace family history
#1055 MONCHESS — Chess game with great graphics.
#1059 PC GENERAL LEDGER — Double entry bookkeeping system. Handles 5 bank accounts and 8 depts.
#1061 SLEUTH — Crime solving adventure.
#1063 VIDEO MONOPOLY — Up to 4 players.
#1052/3/4 PC-FILE + DISKS 1,2,3 Famous database prog. written by Jim Button.
#0002 OMEGAN FLIGHT — Fight the black warriors.
#0005 STRIKER — Helicopter fighter game.
#0055 MAIL MONSTER — Mailing labels.
#1006 PINBALL BONANZA — 5 pinball machines to choose from.
#0125 PC PROFESSOR — Basic language tutorial.
#0197 HARD DISK UTILITIES — Hard disk manager.
#1022 INSTANT CALENDAR — Creates wall planner.
#1013 SUPER POKER AND HEARTS — Card games.

DEALER ENQUIRIES WELCOME.

JUST RELEASED

#1066 LOAN PAK — Calculate and forecasts loan repayments.
#1089 FAST INVOICE WRITER — Calculates and prints 2 invoices per A4 page. #1078 FLU SHOT — Anti-virus prog.
#1084 CROSSWORD CREATOR — Create your own crossword.

Outstanding software for IBM PC's and compatibles.

YES! I want the best! Send me my MEMBERSHIP KIT in FREE-SOFT NETWORK ®, PLUS the following diskettes. (Write catalogue # of any SIX of the above list)

At your SPECIAL OFFER FOR $39
Plus postage and handling ..... $ 4
(If you want more than six diskettes, just add $9 for each extra diskette)

As per ☐ My cheque ☐ Bankcard ☐ Visa ☐ Mastercard ☐ Am. Express

Card No. ..... Exp. Date .....

Signature ..... Name .....

Address ..... Sub .....

State ..... Postcode ..... Phone .....

Post to (no stamp required)
FREE POST No. (1)
FREE-SOFT International
PO Box 398
NORTH BALWYN, VIC 3104

Or use our
24 hour
7 days a week,
HOTLINE (03) 859 4697

L I B R A R Y

Sextant/508

Ramses II was not one to mince words. When it came to getting a point across, he was very direct — what was written was in fact etched in stone.

If he ruled today — in this exciting *Information Age* — he'd feel compelled to update his method to input and retrieve information. Being the meticulous type, Ramses would choose page recognition software that was accurate, fast and above all, flexible. Ramses would definitely choose *OmniPage*® to get the job done.

Let's face it, some scribes have less than perfect "*chipmanship.*" Ramses would require the most versatile page recognition software — one that could scan any font or font size, even multiple columns of text — no matter which scribe created it. There's nothing more frustrating than a misplaced hieroglyph. He'd definitely want it to support *MacWrite*™ and *Microsoft Word*,™ two of the most popular word processors within his kingdom. When it comes to page recognition software, he'd want the very best product at the best possible price.

He'd want *OmniPage*! And who would argue with the Pharaoh?

When you think about it — can you really blame him? There's just no substitute for a powerful, full-featured page recognition package. How can you afford to make a mistake when your entire "dynasty" depends on it?

So It Is Written...
So It Shall Be.

Means that *OmniPage* can read virtually any font, in sizes that range from 8 pt. to 72 pt.

This unique landscape feature means that spreadsheets and financial documents are only a scan away. A great addition to your royal granary if storing and accessing numerical data really counts!

Multiple column feature means that complex, compound pages of text and graphics can be handled—automatically.

Transitional Editor™ lets you review scanned text before exporting it to a file. Cut, copy, paste, insert and delete text — or take advantage of the powerful search and replace tools which allow you to modify a page.

Reads and outputs underlines, bold faces and italics.

Supports the most popular word processing programs for the Macintosh, including *Microsoft Word* and *MacWrite*.

Supports 11 of your favorite Indo-european languages, including French, German and Spanish.

WYSIScan™ interface takes full advantage of Macintosh's incredible ease-of-use.

OmniPage 2.0 has even more features than ever before — this translates into the most comprehensive page recognition software available — anywhere — for any dynasty — at any price.

The bottom line in page recognition software — eliminating excessive key strokes* for all time.

OmniPage 2.0 now available!

*Egyptian scribes had a real time of it when it came to excessive key strokes. Each letter, or hieroglyph, had to be individually etched into stone. And we complain today about writer's cramp?

OmniPage is a registered trademark of Caere Corporation. *Transitional Editor* and *WYSIScan* are trademarks of Caere Corporation. *Apple* and *Macintosh* are registered trademarks of Apple Computer, Inc. *Microsoft Word* is a trademark of Microsoft Corporation. *MacWrite* is a licensed trademark of Claris Corporation. Egyptian bust of Ramses II courtesy of the Rosicrucian Society of San Jose, California. ©Copyright 1989 Caere Corporation. All rights reserved.

For your nearest dealer:

OMNIPAGE AUSTRALIA PTY. LTD.
1st Floor, 132 Willoughby Road, Crows Nest 2065.
Phone: (02) 906 4900 Fax: (02) 906 4835
or TOLL FREE: 008 252 829

JAY FREIS/THE IMAGE BANK

After 200 years of development, the attitude of companies towards electronic mail is extremely polarised – from 'we couldn't run our business without it' to 'we tried it, and found it too time-consuming.'

forward systems, by definition, carry their messages enclosed in 'packets,' which mean that there will be a set number of bytes on the front, which provide information such as the address, priority and need for receipt notification, and possibly a few more bytes on the back, which usually provide error-checking.

Between these 'envelope' book-ends will be the contents of the message, but these contents might, themselves, contain complete 'packets,' or specially formatted data from another system. The MHS doesn't care what it has in the contents section, as long as it can be interpreted or translated at the other end. For this reason we can have EDI and EFT (each with their own protocols) piggy-backed onto X.400 messaging. They gain by using a universal system with extra levels of security provided by public-key encryption techniques. We'll talk more about this later.

X.400 services differs from the well-known X.25 packet-switching networks in that the latter send information progressive in small 'packets' – usually 128 bytes at a time – and these packets are only reassembled into a full message file at the other end. X.400, by contrast, only sends one 'packet' containing the full message. This avoids the problem of missing sections of data, or of packets that arrive out of order because they were held in store for too long during relay, but it also means that the MTA and MS computers in the system must be capable of storing very large amounts of data in case you are transferring large files. Generally, however, MTAs will be transmitting the beginning of a file while the end of the file is still being received.

Within this one message 'packet' there will be 'sub-packets' of information (content) that travel end-to-end unread by the MTAs. This terminology isn't really correct, but since there doesn't seem to be a recognised name for these sub-packets, I'll call them 'chunks.' They are the key to understanding how this can be a universal messaging system. The 'contents' section of the message will consist entirely of a series of these chunks of information that your UA (User Agent/PC) transmits to the UA, MS or AU at the other end.

For instance, the message contents will always include date and time information, so this will be in one chunk. We need to tell the recipient what type of file this is, and it makes sense to incorporate this along with the text bytes in another chunk. Then sometimes machine-to-machine messages will need to be transmitted; perhaps to ask questions like 'Has message # 35892 been read yet?' where the answer will be in Boolean (Yes/No or True/False) form, and in its own chunk. The system is designed to have a lot of automated checking and confirmation procedures.

These chunks are all set in ASN.1 (Abstract Syntax Notation 1) form, which is the standard 'language' of OSI. ASN.1 is a very simple standardised way of including 'format' or 'semantic' information, and you are going to come across it a lot in the next few years so it is worth looking deeper. It is actually a Presentation layer (Layer 6) standard used by X.400 to 'provide

rules for defining and recording the meanings (or semantic contents) of messages.'

'Syntax' is the better term because that means rules-of-grammar. For instance, a '?' (question mark) tells us that the previous words pose a question. Doesn't it? This is syntax, but in ASN.1 they put the syntax information ahead of the contents string.

Abstract Syntax Notation

THERE ARE THREE parts to an ASN.1 string (see Figure 2). The first byte specifies the Data Type according to the Universal Class Tag Assignments. If this byte is between (hex) $01 and $11, it means that the message following is a 'primitive': $01 for Boolean; $02, Integer; $03, Bit String; $04, Octet String; $05, Null; and so on.

Between hex $12 and $15, and also between $19 and $1B, the Data Type byte defines Character String Types (respectively, Numeric String, Printable String, ASCII String, Teletex string, Videotext String, and so on). Date and Time are defined by either hex $17 or $18.

The second byte in the chunk indicates the length of the data that follows. With some data-types, two or more bytes are reserved for the length information. All subsequent bytes (up to the stated length) will be the information carried. So, for instance, a three byte ASN.1 chunk, like

```
$01, $01, $FF
```

will be interpreted as 'Boolean type, length = 1 byte, $FF = True.' The computer also knows to expect that the fourth (next) byte will be another Data Type for the next chunk. Another example: let's say the chunk consists of –

```
$17, $0A, $38, $39, $31, $31, $30, $04,
$31, $30, $30, $38
```

If you were to sit down with your hex-translation book and you knew the formatting standards, you would find that this translates to 'UTC Date/Time type, length = 10 bytes' followed by '8 + 9 (year) 1 + 1 (Month = Nov) 0 + 4 (Day) 1 + 0 (Hour) 0 + 8 (Minute).'

You can see that although you waste a couple of bytes each time with the Data Type and Length code/s, you gain an enormous amount of flexibility because you are constantly telling the UA on the receiving end, how to interpret the data that follows. It can immediately distinguish Date information, from Boolean (True/False), from Numerical Strings. And, it immediately knows which are ASCII strings and which are formatted Teletex strings, or whatever. There is immense power in-built here in a very simple way.

For handling text strings, X.400 uses three sub-types of chunk. The Short-form has only one byte for length and therefore can handle only up to 128 characters at a time (1 bit is reserved); the Long-form can handle from 128 to 2^{1008} bytes, and the third Indefinite form can be of any length and is terminated by trailing zeros.

So what's the significance of all this?

Well, if you remember back to the old days of Teletype machines with the 5-bit Baudot code, you'll remember that they were only able to generate 2^5 (= 32 different byte variations). This was not enough even for a full set of capital letters and the ten basic numerals, let alone spaces, punctuation, signals (such as the Bell) and formatting devices like the carriage return. The way they got around this problem was by designating one of the 32 codes as a 'shift-on' command, and another as a 'shift-off' which doubled the keyboard capacity.

Now we use an 8-bit standard with 256 variations, but this isn't enough. We are moving into an era where we want to send graphics and sound files over the lines, and we want highly formatted documents to be transmitted to complete strangers without having to arrange file-formatting details with them beforehand. We can't do this any longer by just selecting from our 256 possibilities, so we need to have a sentence (multiple byte) structure where the first word establishes the rules, and something like a full-stop marks the end of the rules application.

Enter ASN.1. This is an extension of the old Teletype idea of the special code-change character – but in this case they've got 256 variations in possible Data-type characters, not just two. And, they've also added a length byte or two, so the whole data chunk becomes an entity, and we know where the the application of the rule ends.

ASN.1 is extraordinarily flexible and almost infinitely extendible, and if you think about it, you will see that it allows us to combine the attributes of a free-form database (each chunk is essentially a specified type of 'field' with the field-data length provided by the second byte) with the continuous stream of bytes needed in word processing, sound and graphics. And all sorts of system information and machine-to-machine messages can be carried in the same basic packet design without any fear of confusion – this is what makes it so universal in application. □

International directories

THE X.500 DIRECTORY Service standard will eventually allow you to key-in and find the details about any company or person connected to the system, anywhere in the world. We are coming out of the Dark Ages; there'sa light at the end of the tunnel!

The proposed international on-line directory will store e-mail addresses; facsimile, telex and telephone numbers; postal addresses and a range of optional company or personal details. The major national directory mainframes around the world will eventually constitute one enormous distributed database, and you will simply address your query through your local e-mail service.

Queries will be passed on down the line until the information is found. Eventually this will be extended further with full-text searching on all details to the point where it will become a French Teletel-type yellow phone-book system where you can look up, say, all the Indian restaurants in London, or all French-speaking lawyers in Frankfurt.

Telex has always had one unique advantage over other electronic messaging systems, in that Telex messages have some legal standing due to the answer-back facility. When you establish a Telex link, it automatically replies giving an inbuilt identification name installed in hardware by Telecom.

This has been widely accepted by the courts as evidence that a message had been communicated, and Telex could therefore be used to accept contracts or place orders. The courts would act on Telex messages as if they were signed letters. Under X.400, e-mail systems will take this proof of receipt even further.

The recent additions to the standard at the CCITT Melbourne meeting included extensive security and public-key encryption techniques. Public-key encryption allows very secure identification of both parties by 'digital signatures.' Supposedly the system is now so secure that NATO have specified X.400 message encryption as a requirement for future defence communications.

ACCOUNTING FOR SPREADSHEETS

Almost everyone when asked to do some business analysis reaches for a spreadsheet, and 70 per cent of those reach for Lotus 123. But there are many other ways to analyse than with a spreadsheet, and there are many other spreadsheets than 123. Steve Keen begins a new series on spreadsheets and data analysis . . .

SPREADSHEETS AND Lotus epitomised the IBM PC and AT which were the second wave of PC hardware (with CP/M systems and the like being the first). But there is no way that spreadsheets – as they're currently perceived – can epitomise the third wave: the '386 machines which have finally abandoned the PC/AT's 640K architecture. Spreadsheets, like the hardware they run on, have to evolve to survive. However, the evolution is proving hard for some, Lotus in particular.

A sarcastic and very amusing promotion from the distributors of SuperCalc involved 3-D cards showing scenes such as a 'Lotus Version 3 User Group Meeting' – a hall full of empty chairs – emphasising the point that Lotus version 3 was more than a year overdue. 123 version 3 is to be Lotus' third-generation spreadsheet (Software Arts' VisiCalc, which Lotus largely cloned, was the first) and like SuperCalc's cards, it involves three dimensions: spreadsheets with depth as well as width and height. But Lotus's difficulties notwithstanding, the third generation is already upon us, in the shape of other 'multi-dimensional' products.

Multi-dimensionality means the ability to see your data from more than the two perspectives which are the comfortable limit for a conventional spreadsheet. With 123, producing a table of sales of different products by months is easy. What's not so easy is producing a table showing sales by product, by month, and by salesman. This is where the third (or greater) dimension comes in, and it's why Lotus' failure to ship its three-dimensional product is becoming so important. Lotus won the hearts and minds of PC users simply because 123 was the first spreadsheet available on the PC which exploited the power of the new machine – up to 640K of RAM, and graphics. But there is no way that such a product exploits the power of 386 machines which can access up to 16Mb of RAM. Unless Lotus gets a move on, it could fail with the new generation hardware for the same reason its competitors failed against it.

The problems with spreadsheets

VISICALC WAS THE first application which made people take PCs seriously as business tools. The spreadsheet's free-form power let non-programmers do a lot of complicated analysis easily. The appeal of spreadsheets is the ability to construct a complete model bit by bit, to put your equations wherever you like, and then see the results immediately on screen. But there are many ways in which the strengths of the spreadsheet are also weaknesses.

For a start, when you enter an equation into a spreadsheet, all you see on screen is the result, not the equation itself (unless you're editing that cell). In essence this makes it very difficult to gauge the veracity of the number it produces, but in practice most people tend to take the numbers as 'Gospel' – until they base a corporate decision on them and find their cash flow evaporating through an incorrect equation. The problem of knowing what is actually generating your numbers is made worse by the way in which formulas are constructed – typically by alphanumeric cell references ('+B$4(A17-$C17)') which can refer to cells stored anywhere on the sheet.

Those two problems together generate the third – lack of accountability. Though there now exist packages which can 'audit' your formulas, even these can't overcome the problem that your equations are expressed in terms of variable names (A12,BX35) which even Basic programmers have long since abandoned in favour of meaningful English labels. Likewise, an enormous spreadsheet – and many companies have strategically significant spreadsheets pushing up towards 300K in size – can have a multitude of equations which would take an aeon to decipher.

Concealed formulas, Spaghetti code and unaccountability are deficiencies of the spreadsheet which strike you if you are lucky enough to be able to shoehorn your data into a spreadsheet in the first place. But there are many business problems which can't adequately be handled with a spreadsheet – problems which vary by more than the two dimensions which are the comfortable limit of a spreadsheet.

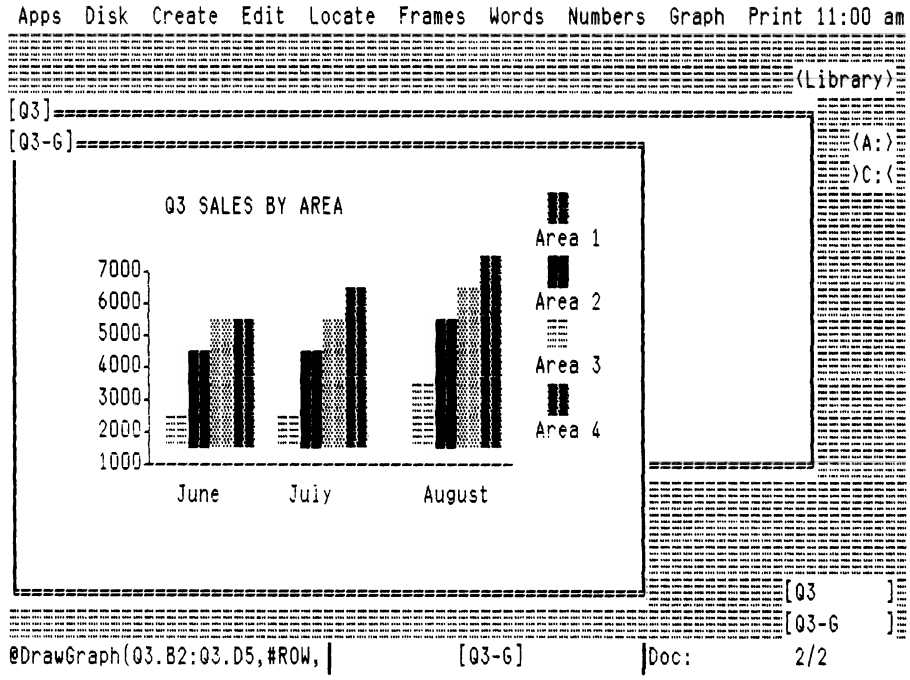
Each entry in a spreadsheet is essentially an isolated number – in mathematical jargon, a scalar. Yet the data we enter is normally related – monthly data on interest rates, daily data on stock movements, and so on – which in mathematical terms is a vector. This is the problem which lies behind the need to manually extend the range of a database; with a vector definition of 'Interest Rates', the vector would simply grow as new entries were tacked on to it. This deficiency makes it a lot harder to handle time-based data than it would be with a system which recognised time, or the other dimensions by which information varies (region, salesperson and so on).

The simplest example is attempting to analyse sales data to work out whether your salespeople, your products or demography are responsible for sales

being higher in one region than in others. There are three factors impinging on each sale: the product sold, the region it is sold in, and the salesperson. A spreadsheet can comfortably show only two, with several tables showing sales by salesperson and product for each region. Similar problems arise for financial analysts, share traders, engineers analysing quality control data.

The spreadsheet definition of a database is extremely tardy indeed. You must define not just the beginning range of a data table, but its end as well; if you regularly append data to it you have to just as regularly extend its end. This causes immense problems when you must perform the same function on constantly updated data. Say your job involved regularly graphing the progress and regress of the Australian dollar over a one year time period. Every new day's data would require you to redefine both the database range and the graphics range.

Those two problems together generate the third – lack of accountability.



A disappointment is the quality of the graphs in FWIII – when FW II was released, its graphs were not far behind leading graphics packages; now they are a universe behind the leaders, and there are spreadsheets around with far superior graphics.

The solutions

ONE FEATURE of the spreadsheet paradigm which can't be overcome is that it displays numbers rather than equations: removing this aspect would largely destroy their appeal. But it is possible to replace alphanumeric formulas with English language ones, and it is possible to replace the Spaghetti code with modular spreadsheets and formulas. Equally, some programmers have beaten Lotus to the punch and already produced three-dimensional spreadsheets, which dramatically expand your ability to handle problems involving data consolidation and disaggregation.

Then there are the non-spreadsheet programs, which provide enormous analytic powers without a slash key to their name. There are many occasions when the computer users natural instinct to reach for the spreadsheet should be abandoned in favour of these far more refined tools.

This month we will look at one advanced spreadsheet – FrameWork III – and next month, the latest incarnation of Computer Associates' SuperCalc (which has been nibbling at Lotus' market share for years now). Future articles in the series will look at 3-D spreadsheets, Javelin Plus (the recent upgrade to a package which was originally – and erroneously – touted as the spreadsheet killer), the ultimate multi-dimensional product PC Express, and several non-spreadsheets – among them Mathcad and TK Solver.

FrameWork III

LIKE MOST users, when I want to do analysis, 90 per cent of the time I reach for a spreadsheet. Only the sheet I grab isn't Lotus – it's FrameWork III. FrameWork is generally regarded as an integrated package – and it is also probably the most powerful 2-D spreadsheet available. One reason for this is the program's truly integrated nature. Most integrated packages are no more than a menu system sitting on top of several different applications. You choose an application – such as the spreadsheet – and you are limited to its powers only, with normally only one spreadsheet at a time.

FrameWork is object-orientated: you create an object (a database frame, word processing frame, spreadsheet frame) and the relevant processing powers of the program are immediately available. You can also create multiple objects in FrameWork – multiple spreadsheets, multiple word processing frames – and use information contained in one object in another. This lets you break a large spreadsheet problem down into numerous smaller ones – modular spreadsheeting.

All these multiple spreadsheets can themselves be stored in the one containing frame, which can also contain explanatory word processing frames (and graphs, though these are certainly not presentation quality). This overall document comes with its own structured table of contents through FrameWork's exceptional outlining facility, which uses the title of each frame as a 'table of contents' entry.

FrameWork's second advantage comes from its ability to flip from the typical alphanumeric formulas to English language ones with the press of the exclamation key. Most spreadsheets have meaningful labels along the top and down the side; press the '!' key and these labels are used to construct formulas, rather than the cell references. FrameWork outdoes Lotus' point and build utility through its integration: you can point at cells stored in other spreadsheets (or values stored in a single object or frame) to include them in your formula.

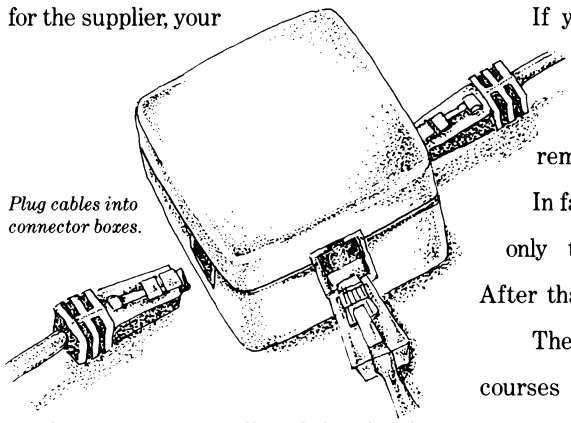
AT $999, THE HARDEST THING TO UNDERSTAND ABOUT OUR NETWORK IS THE PRICE.

Networking your PCs used to be a very expensive exercise.

To begin with, you'd have to part with up to $4000 just for all the hardware components.

Then the installation would be so difficult that the supplier could get away with charging another $500 to install the network.

And although the installation is easy for the supplier, your



Plug cables into connector boxes.

productivity is virtually nil for the day-and-a-half it takes him to install it.

Not to mention the software.

Sure they might throw it in for free (if you're lucky) but it's usually so technical that everyone will need to do a two-day course just to understand it.

But you put up with all this hassle because you know at the end of it, your office communication will be superb. A great PC network but at what price?

Try $999. That's all you pay for the Amstrad Network.

Everything you need to connect three Amstrad (or other IBM compatible) PCs is included in the one package.

There's network cards, connectors, software, cables and a really simple instruction manual.

It's simple because our network is so easy.

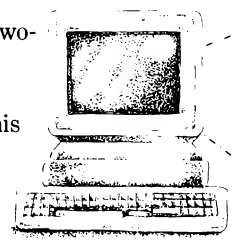
Easy to install. Easy to use. Easy to expand.

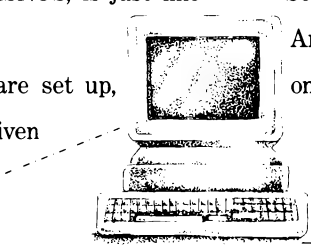
If you can connect a printer to your PC, installing the Amstrad Network will seem remarkably simple.

In fact, the whole installation process only takes about forty-five minutes. After that your network is ready to use.

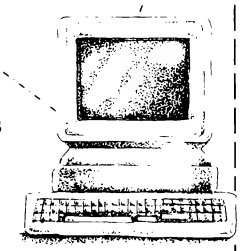
There's no need for extensive training courses because Amstrad's Network operating system, AMSNOS, is just like using MS-DOS.

Once the users are set up, using simple menu-driven commands,



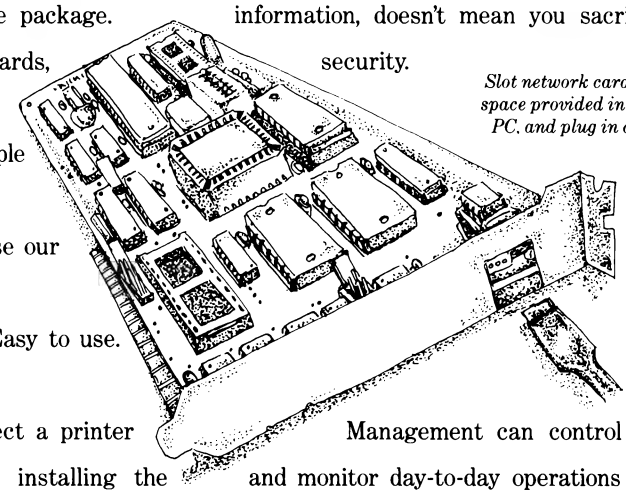


Transfer data to and from any PC on the network.



you'll be sharing expensive peripherals and communicating a lot more effectively.

But just because you can send and receive electronic mail, data and other information, doesn't mean you sacrifice security.



Slot network card into space provided in your PC, and plug in cable.

Management can control and monitor day-to-day operations and security of hardware, software and data.

And the Amstrad Network will grow with your company.

By adding a second pack you can link six workstations. From there, you can expand up to 64 workstations through Corvus upgrade facilities.

So send in the coupon or see your local Amstrad dealer for more information on the easiest network available.

But hurry, because stocks are selling fast. At $999, it's not hard to understand why.

Please convince me that networking can be so easy and inexpensive.

Send to Amstrad, PO Box 615, Kings Cross, NSW 2011.

Name _____ YC

Address _____

Postcode _____

Phone _____

AMSTRAD

For the price, you get the works.

Conroy Partners/AMS 1160 (R3

*Price quoted is RRP at time of print and is subject to change without notice. Amstrad name and logo are trademarks of Amstrad Plc © 1989 Amstrad Pty Ltd. IBM is the trademark of IBM.

All this text necessarily eats space; FrameWork transcends this problem with its ability to store full-screen formulas of up to 64,000 characters in each spreadsheet cell. The end result is a spreadsheet model which is far easier to construct and audit than one executed in Lotus, or any other single sheet, non-English language system. Construction is simpler because each stage in the development of a model is executed in its own, small scale spreadsheet. Formulas, as you construct them, are written in English – there's no need to continually refer to the sheet's borders to work out what A12*(B1-C1) is actually doing; your formula tells you that it is '[1989].Insurance*(1+Parameters.[1990].$ Inflation)'. Auditing is simpler for the same reason.

The four elements to FrameWork's interface are pop-down menus, function keys, the numeric keypad and its help system. FrameWork didn't quite pioneer pop-down menus, but it did perfect them. Its ten main menu options are visible at the top of the screen at all times, and accessible either by pressing the Ins key (which FW treats as Instruct rather than Insert), or by typing the first letter of any option while holding the control key down.

```
Apps  Disk  Create  Edit  Locate  Frames  Words  Numbers  Graph  Print 11:00 am
==========================================================================(Library)=
[]=========================================================================
|LASTNAME    FIRST       ADDRESS       CITY       STATE    POSTCODE      ==(A:)
|=========================================================================)C:(
|Evansen     George      16 North St.  Tresco     Vic.     3583
|Habash      Susan       49 Evers Av.  Nyamup     WA       6258
|Mikkels     Fred        119 Ace Ct.   Kadina     SA       5554
|Morgan      Mike        7 Kairi St.   Kayena     Qld.     7270
|Juc         Jan         14 Janjuc     Jan Juc    Vic.     3228
|Simms       Alice       23 Crean St.  Adelong    NSW      2729
|Kelso       Graham      11 Eagle Pl.  Anna Bay   NSW      2301
|Handel      Georgina    3/5 Main St.  Aitkenvale Qld.     4814
==========================================================================
                                                                [        ]
                          |      [].LASTNAME        |Recs:        1/1256
```

Framework is object orientated: you create an object, say a database frame, and the relevant processing powers of the program are immediately available. The ability to use information contained in one object in another gives 'modular spreadsheeting.'

Main menu

THE MAIN menu items cover creating word, database and spreadsheet frames, applications like telecommunications, searching, numeric controls (formatting of numbers, decimal places, recalculation). Any menu item which is not available (decimal places control in a word frame for instance) is shown in italics. Its function keys cover commands which are menu items in Lotus – such as selecting a range (F6-Select in FW), copying (F7), moving, and so on. This function key immediacy – which is available whether you are moving cells or writing an individual formula – makes it much easier to edit a spreadsheet than with Lotus.

FrameWork's outlining ability – where frames can contain other frames – complicates navigation about a large structured document (one of my documents had 33 frames, including 16 related spreadsheets): in addition to moving up, down and sideways, you also have to move into frames and out of them. FrameWork uses the plus and minus keys on the numeric keypad as 'downlevel' and 'uplevel' keys. It is foreign initially, but rapidly becomes second nature.

FW's help system deserves highlighting as a full feature of the interface: it is still the best help system I have seen. In addition to providing context-sensitive help at the press of F1, there is an Index which functions like the table of contents to a book on FrameWork. Choosing any option leads to the 'Chapter' on that option, followed by the text; and if you want to, you can scroll through the entire book – all 200K of it.

To make use of FW's English language formula capacity, you have to enter label names in row 1 and column A (you can use FW without this feature, but it's rather like driving a Porsche in 1st gear only) and press the ! key. Then formulas are entered much as in Lotus – all functions are preceded by an @ sign, and must be typed in by the user. Formulas which reference other cells can either be written in, or filled out by point and pick methods once you press the up-arrow key (unlike Lotus, you can use the other cursor keys to edit a formula as you type it). Using the Uplevel key, you can reference formulas, numbers or regions in other spreadsheets.

One of the beauties of FW's integration is that all relevant word processor powers – including text enhancements (even subscripts) – are available in a spreadsheet. Likewise, all FrameWork's print formatting powers are at hand. There's no need to define a Range, and so on, to print: you simply print as if your spreadsheets were documents, complete with FrameWork's support of page headers, footers, margins and justification.

For communications purposes, FW can import spreadsheets from and export to Lotus. However, it can't export a spreadsheet which has used English language formulas – which is a major limitation. The best you can manage there is to copy the sheet as numbers only and export that. Another disappointment of FW III on this front is the quality of its graphs. When FW II was released, its graphs were not far behind leading graphics packages; now they are a universe behind the leaders, and there are spreadsheets around – SuperCalc, PFS:Plan, Quattro – with far superior graphics.

Conclusion

ANY LOTUS user who spends more than a day with FrameWork III could never return to 123, in my opinion. While FrameWork doesn't address the multi-dimensional issue, its modularity, English language and effectively structured formulas make designing and managing a complex spreadsheet a comparative breeze. Though it lacks some powers and features that packages like SuperCalc and PFS:Plan tout, overall it remains my first choice for two-dimensional spreadsheeting. □

AST Introduces T
Of The Bus

AST Bravo/286
Extra value, quality and AT-compatibility for business or home office use.

AST Premium Workstation/286
Executive styling and test-proven AT compatibility in a powerful 286 computer.

AST Premium/286
Outstanding, industry winner for general business and technical applications.

AST Premium 386/25
State-of-the-art solution for ultimate LAN file service and CAD/CAM/CAE.

Subscribe to 'Your Co

AST makes the fastest and highest quality desktop computers in the business world. One of them is right for you.

Whether you need a personal computer for general office work, engineering, desktop publishing, financial analysis or running your own business at home, you can count on AST to fit your desktop size, your budget and your need for ultimate speed.

AST really means business

Highest quality and outstanding performance is built into the AST range from the AT compatible AST Bravo 286 to the super power of the AST Premium 386.

And, by simply subscribing to Your Computer you could win a sensational AST Premium 386/25. The prize includes: 80386 25 MHz Processor with memory cache: Key Board: 1.2 Mb Floppy Disk Drive and Controller: 2 Serial and 1 Parallel Port: 2 Mb RAM: 90 MB Hard Disk: MS-DOS GW Basic: EMS and Disk Cache: Software. Plus VGA Screen and VGA Graphics Card.

TOTAL VALUE OF THIS SENSATIONAL PACKAGE, $13,500!

PLUS everyone who subscribes now or extends their current subscription will receive the innovative Australian designed storage system, Hangaway™ worth $8.95 yours free. The Hangaway™ has hundreds of applications around the home, workshop and garage.

he Seven Wonders
iness World.

mputer' and win one!

Subscribe now and win!

Simply fill out the coupon attached and place it in the reply paid envelope supplied — if the coupon and envelope are missing, send your name, address, phone number and cheque, money order or credit card details (card type, card number, expiry date and signature) to Federal Publishing Company, Freepost No 4, P.O. Box 227, Waterloo, NSW 2017. Any enquiries may be made by phoning (02) 693-6666. Unsigned orders cannot be accepted.

AST Research ANZ Pty Limited
Level 3, 178 Pacific Highway
St Leonards, NSW 2065
Tel: (02) 906-2200
Fax: (02) 906-2316

AST RESEARCH
The Natural Progression

Conditions of Entry

1. The competition is open only to Australian residents authorising a new/renewal subscription before last mail October 31, 1989. Entries received after closing date will not be included. Employees of the Federal Publishing Company, AST Research ANZ Pty Limited and their famiies are not eligible to enter. To be valid for drawing, subscription must be signed against a nominated valid credit card, or, if paid by cheque, cleared for payment. 2. South Australian residents need not purchase a subscription to enter, but may enter only once by submitting their name, address, and a hand-drawn facsimile of the subscription coupon to The Federal Publishing Company, P.O. Box 227, Waterloo, NSW 2107. 3. Prizes are not transferrable or exchangeable and may not be converted to cash. 4. The judges decision is final and no correspondence will be entered into. 5. Description of the competition and instructions on how to enter form a part of the competition conditions. 6. The competition commences on July 22, 1989 and closes will last mail on October 31, 1989. The draw will take place in Sydney on November 3, 1989 and the winner will be notified by telephone and letter. The winner will also be announced in The Australian on November 7, 1989 and a later issue of this magazine. 7. The prize is: One AST Premium 386/25 Personal Computer package valued at $13,500. 8. The promoter is The Federal Publishing Company, 180 Bourke Road, Alexandria, NSW 2015. Permit No. TC89/000 issued under the Lotteries and Art Unions Act 1901: Raffles and Bingo Permit Board Permit No. 89/000 issued on 00/06/89: ACT Permit No. TP89/000 issued under the Lotteries Ordinance, 1964.

12 month subscription only $45 (12 issues)

COMPUTERS THAT TALK... AND LISTEN

Just like people, it's easier to make computers talk than listen. . . Craig Kirkwood reports on the latest developments in Natural Language Processing, a branch of Artificial Intelligence that is rapidly coming of age.

MACHINES THAT talk and listen have long been on the research agenda for those who pursue that enigmatic frontier of computing: Artificial Intelligence. But it's not easy. For a computer to converse with another of its kind in this age of communications is no great feat. Everyone has a modem, if not a facsimile, if not a network of some kind through which their computer can talk to another device of digital persuasion. Getting computers to talk to people, who are definitely analogue by nature, is a more challenging task.

Talking is easier than listening, computers tend to agree with people on that. We have had for some time the technology to synthesise speech on a machine. We even have the ability to record and replay speech, through digital sampling, on the humblest micro. What we don't have (yet) is a machine that will engage in conversation with anyone at the dinner table.

The branch of AI which concentrates on comprehension of human language has been dubbed Natural Language Processing (NLP from here on in). Database query, document interpretation, language translation, expert systems and assistance for the handicapped are are some of the areas eager to exploit NLP technology. The following article discusses some of the progress and problems of this new growth area.

Interpreting speech

NLP RESEARCHERS are not so much concerned with speech recognition as understanding speech once it is in the hands of the computer. This includes typed or written entry. Speech recognition, though, is itself a challenge for computers, without understanding it. After all, English is a notoriously difficult language to learn (ask anyone who's learned it as an adult)

Apart from the 26 letters of the alphabet, English contains 40 phonemes – combinations of vowels and consonants. There is a total of 16 vowel and 24 consonant sounds connected by diphones of which there is approximately 2,650. Variations of the basic sounds through allophones (phoneme derivatives) lead the average adult to possess a vocabulary of some 100,000 words. Not only that, but English is full of homonyms – words that have two or more meanings but the same sound: 'right/write', 'meat/meet', 'die/-dye' and 'principle/principal', to name but a few.

Unfortunately, we don't really know how humans are able to make sense of the stream of sound that is spoken language; just as we don't really know how the brain functions. Early techniques of speech recognition involved storing sound patterns of a selection of words and then comparing the input to attempt a match. A system devised by the US Defense Department in the 1970s used this technique and managed to achieve an error rate of some 25 per cent when used one word at a time.

Connected, conversational speech, though, bears little resemblance to the stream of sound made when words are uttered individually. Syllables of adjacent words tend to blend into one, particularly in the somewhat lazy speech patterns of we colonials. It becomes difficult to interpret the end of one word and the beginning of the next. Accents and local variations of language tend to change the inflection and timbre of sounds confounding the problems further.

Overcoming the difficulties of accent, homonyms and the fluidity of continuous speech requires some intelligence. What is needed is a system with a 'knowledge base' to interpret the utterances in context and then comprehend them as a meaningful group of sentences. This is where NLP research holds its own, both to analyse and to comprehend, natural language.

Syntax and semantics

THE CLASSICAL approach to interpretation of natural language has focused on two analyses: syntax and semantics. (Analysis of text by computers, incidental-

ly, is called 'computational linguistics'.) Syntax is about the mechanics of language. A syntactic analysis involves breaking a sentence up into functional, grammatical sections. The analysis is performed by a technique called 'parsing' which is the process of identifying grammatical items and what function each performs. It also attempts to define the 'legality' of the grammar according to formalised rules. The technique is best illustrated in the form of a tree called, of course, a 'parse tree' as shown in Figure 1. The tree shows the hierarchical relationship among the words by embedding them in a structure that indicates which words or phrases modify other words or phrases. The emphasis is on the grammar and function of the words not their meaning.

Almost every word in our language has more than one meaning. In order to understand a word, the meaning must be derived from a series of cyclical passes until a sufficiently primitive level has been reached to understand.

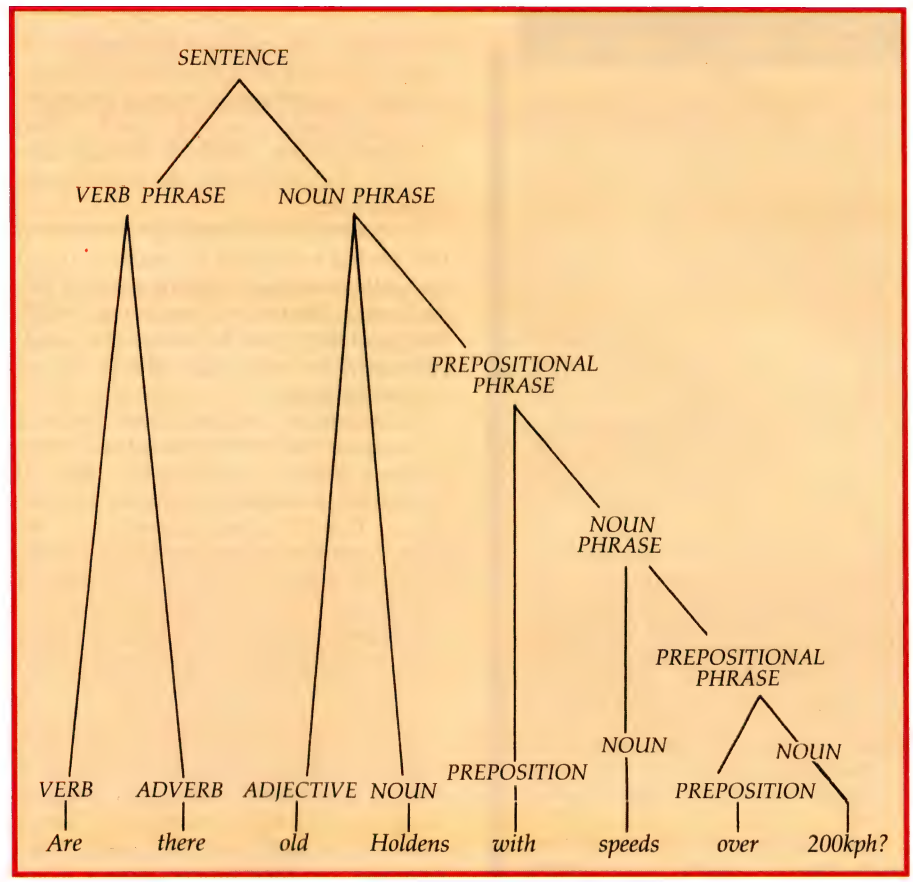


Figure 1. *Natural Language Processing starts with analyses of syntax and semantics. A syntactic analysis involves breaking a sentence up into functional, grammatical sections by a technique called 'parsing' which can be illustrated by a 'parse tree'. The tree shows the hierarchical relationship among the words by embedding them in a structure emphasising their grammar and function, not their meaning. Semantic analysis is used concurrently to eliminate ambiguities caused by variations in tense and plurals.*

The parse tree attempts to break down a sentence to its most basic grammatical elements using formal rules or 'rule-based paradigms'. There have been hundreds of attempts to perfect this technique but the founding work is attributed to Noam Chomsky, who managed to define the rules of English grammar and allow for the processes of parsing.

There are two problems that arise from parsing: structural ambiguity, arising from different legal arrangements of the same words; and 'lexical' ambiguity, arising from words having more than one meaning. A lexical item is basically a word, but includes variations of that word in the form of tense and plural. For example, 'bite', 'bitten', 'bites', 'biting' are all variations of the same lexical item but, obviously, different words. Avoiding this ambiguity requires a concurrent analysis of meaning - semantic analysis.

It is important to understand the difference between syntax and semantics. Consider the phrase 'a hot cup of coffee'. A syntactic parse of the phrase would indicate the word 'hot' modifies (acts upon) the word 'cup'. But we know that the true meaning is that the coffee is hot, not (necessarily) the cup. The parse tree would assign the adjective 'hot' to the noun 'cup' and so must be modified, by consulting the knowledge base, to derive the correct meaning.

It's difficult for a machine to understand word meanings when confronted with a language built up from culture and history. Almost every word in our language has more than one meaning. In order to understand a word, the meaning must be derived from a series of cyclical passes until a sufficiently primitive level has been reached to understand. The lower the primitive level (level of semantic primitive), the more accurate will be the definitions and greater will be the likelihood of correct interpretation. There is, however, only so far down we can go. Theoretically, it could continue indefinitely, but in reality the time taken to find an 'answer' becomes absurd. Like all the best things, there's an economic trade off involved.

Consider the quest for meaning in terms of the parse tree model. Initially, there is a definition for each structure. Each word definition is a miniature group

Defining Language

DID YOU KNOW that in Germany, the rooster fraternity do not say 'cockle doodle doo' in the wee hours of the morning, but 'kicherkie'? Language is indeed a strange thing. Early researchers into the origins of language insisted that words were signs representing their meaning. The 'bow-wow' theory suggests language began as an imitation of natural sounds like, for example, our rooster calls. Another was called the 'pooh-pooh' theory, claiming that language arose out of exclamation of emotion.

Linguists of our enlightened age tend to agree that language is more accurately described as a series of symbols. Language is symbolic in that it is agreed upon among those who use it. Meanings have been arbitrarily imposed on the noises we utter – they mean nothing in themselves. There are those, like our early researching friends, who insist that some words are not symbols, but natural signs deriving from the sound of the action or object which they describe. The fact that German roosters apparently speak a different tongue tends to discredit this. I suspect a little of both is true.

Language as symbols with agreed meanings is evident in non-verbal communication as well. Consider our Anglo-Saxon tradition of shaking hands as opposed to the more intimate greetings of our Mediterranean brothers. This is a convention – an imposed meaning has been given to the act and likewise to words.

Earlier this century, linguist Edward Sapir suggested that language is 'a merely conventional system of sound and symbols... a non-instinctive, acquired, cultural function... a purely historical heritage of a group, the product of long-continued social usage.'

This highlights the relationship between culture and language: the two are inseparable. Language shapes our very understanding of the physical and natural world. We see hear and experience life largely because the language habits of our community predispose certain choices of interpretation. Making computers truly understand natural language will inevitably be an extension of our culture.

of meanings or semantic structures. The individual meanings are combined according to how the parse tree indicates they syntactictly relate to one another. When one word modifies another, its semantic structure alters the semantic structure of the other word. The mini structures are combined; word-by-word, then phrase-by-phrase until eventually the structure that represents the entire clause is generated.

Confused? It is suffice to understand that both a syntactical (grammatical) and semantic (meaning) analysis must be carried out on the piece of text being considered, and they must be carried out simultaneously, to avoid the ambiguities of natural language.

There's more. Another factor involved in language comprehension is the inferred meaning being communicated – beyond that which is explicitly contained in the words. This is called pragmatics – the meaning of a sentence, within its context, and with respect to a broad range of knowledge.

Pragmatic analysis usually takes place after semantic analysis is complete, when the meaning of the sentence is being merged into the context of the ongoing text. While this process is important in assuring intelligent operation, it is the most difficult to achieve. We humans are great pragmatists, due to our extensive knowledge of the world, and can easily place statements in their proper context. Computers, on the other hand, contain only knowledge of their specific domains (knowledge areas) and lack the broad view necessary to correctly determine the intent of the text.

The Natural Way

WHILE WE battle with syntax, semantics and pragmatics, there is a bold new approach to Natural Language lurking in the wings. David Powers of Macquarie University has been making considerable progress with the creation of systems which learn language from their environment, in the same way that an infant does. He has attempted to emulate the cognitive processes of the brain with reference to the more abstract sciences of 'psycholinguistics' and 'neurolinguistics'. Says Powers: 'The responsibility of learning grammar and vocabulary of the language may be placed on the computer system itself... the system must be provided with sufficient interfaces, generalisation capabilities, and an interesting accurate environment, so as to learn 'Natural Language' the way we do, 'The Natural Way.'

For a machine to learn the way we do, it requires a construction similar to the way our own grey cells are arranged. The brain is composed of over 12 billion specialised cells called neurons. These cells hold the secrets of learning and mental function and, it seems, are reluctant to divulge them. Contemporary science understands the mechanical process by which neurons interrelate and transmit impulses. What we don't know is how the functions of thought emotion and learning fit in.

There are three type of neurons. Sensory or afferent neurons which transmit pulses to the central nervous system; motor or efferent neurons which transmit from the brain or spine to the muscles and glands; and finally, inter or associative neurons which receive impulses from sensory neurons and transmit to motor neurons or to themselves.

Getting computers to talk to people, who are definitely analogue by nature, is a more challenging task.

Neurons are constructed of several parts. The main body with a nucleus in the centre; dendrites, which receive messages from adjacent neurons; and an axon. The axon is important because it is responsible for the transmission to the next neuron. The axon is shrouded in an insulating sheath which is broken at regular 'nodes' to allow electrochemical flow. At the end of the axon (which may vary in length between several fractions of a millimetre to several feet depending on where it is) is a series of tentacles terminating in 'terminal buttons'. The axon tentacles converge along with many others at a synaptic junction.

It's here that it gets interesting. It is by way of the synapse (region of contact between the axon and the next neuron) that transmission occurs between neurons. The synapse is actually a tiny gap across which a transmitted charge flows – not unlike the principle of a spark plug. The neuron takes the sum of the synapses and if the stimulus goes beyond a certain threshold it will 'fire' and stimulate other neurons to activate a muscle, process a thought or whatever the task may be.

Language is frequently considered

analogous to the information transfer process which takes place throughout the nervous system. According to Powers, 'the same sorts of learning mechanisms which are found elsewhere in the nervous system are likely to be employed in language.' His work has led him to believe that the learning of a language for an infant comes in bursts. The child develops confidence in its grasp of linguistics and then crosses a threshold to reach a new level of knowledge. This process can be observed when a child temporarily, apparently arbitrarily, adopts an incorrect nuance of speech. For example the adding of the suffix 'ed' to all verbs (goed, wented). Just as suddenly, the child may correct the error. Powers likens the process to a stroke on a painting: 'Once such rules are confirmed beyond a certain threshold of confidence, they will suddenly become the bold new stroke on the painting. They will become available for language production'.

The CD player, like computer memory, is a digital storage device.

The mechanics of sound

THE ADVENT of the Compact Disc player has brought the world of digital sound to the mouths – and ears – of babes and sucklings. The principle on which the CD player is based is called 'digital sampling'. This is a simple account of how it works: the human ear detects sound through the vibration of a tiny membrane called the ear drum. The drum vibrates in sympathy with the pressure waves of sound. The higher the sound is in pitch, the more waves reach our ear over a given period of time and the faster the drum vibrates; that is, the higher the frequency.

This form of wave motion is called 'analogue' because the wave is analogous to the sound. Traditionally, sound has been recorded on analogue devices like records and magnetic tape. The grooves on the record and the magnetic variations on the tape are analogous to the nature of the sound wave – they vary in direct proportion. In order to record on to the respective material, the sound is converted through a microphone into electrical pulses. The pulses are then acted upon via the electronic circuitry and are sent to a tape head or record press which in turn act on the surface of the tape or record.

The reverse process occurs when the tape, say, is played back. The tape head picks up the variations in magnetic strength over time and converts them into electrical energy. The electrical waves are acted upon (to achieve the required level, or allow for any 'biases' from the tape) and then sent to an amplifier. The amplifier boosts the electrical signals to a high level and sends them to the speakers whose voice coil pushes air back and forth to produce a pressure wave – sound.

Now, the CD player, like computer memory, is a digital storage device. This means that instead of storing the sound on a medium which is manipulated in sympathy with the shape of the sound wave – an analogue system – the sound is converted into binary, or 'digital', code. The process of conversion into digital code capable of storage in memory is called sampling – see Figure 2.

Now, the example in Figure 2 raises the question, why not simply sample our voices on our computers and store them ad infinitum? Well, the problem is memory. For a start you need a device to sample the sound into digital code but that isn't so difficult. The memory required to sample at a suitable rate for speech is huge, but not, I should add, insurmountable.

Sampling keyboards have been around for some time now, with stored sounds on disks being reproduced at the press of a key. Now that CD ROM has breezed into our vocabularies with the promise of memories grand and talk of 'gigabytes' and 'terabytes', there is no reason why speech could not be stored in large amounts on PCs.

One of the most prominent areas of

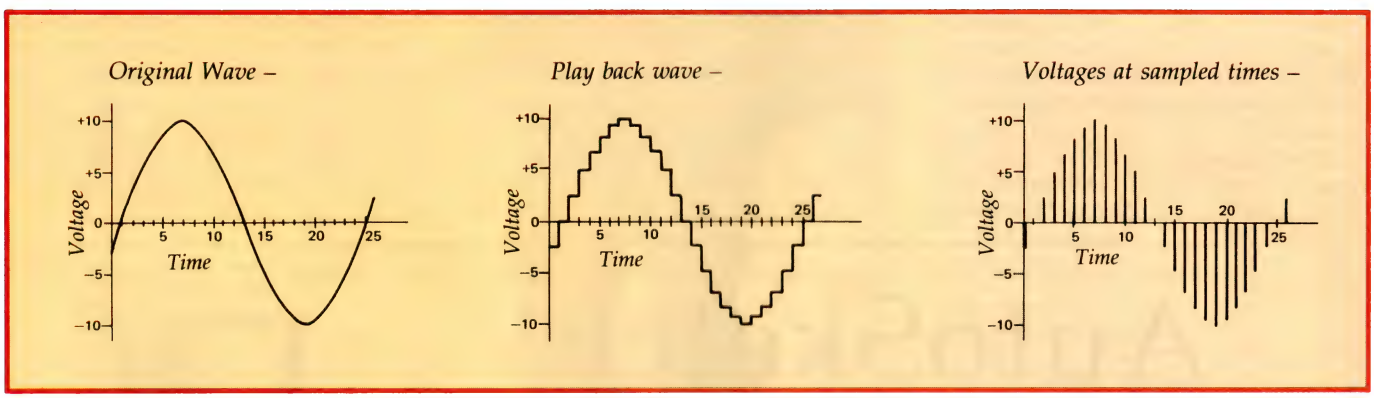


Figure 2. *As an example of sound sampling and synthesis, consider a sound wave converted into electrical energy as a simple sine curve. The curve plots electrical amplitude (level) against time. To convert this wave into a digital code, the level of amplitude is recorded, or 'sampled', at specific intervals of time and is then stored as a binary number. When the sound is played back, the code representing the level at the first time period is converted back to electrical energy then converted to sound energy by the speakers; for the next time interval, the process is repeated and so on. The more often the original wave was sampled, the more accurate the reproduction will be when it's converted back to sound. How often the sound is sampled is called the sampling rate. It is this figure, incidentally, that is often quoted by CD (and, increasingly, computer) manufacturers.*

speech synthesis research is that involving rehabilitation and the handicapped. Alan Crow of The Rehabilitation Equipment Centre (TREC) in Melbourne is nearing completion of a product called the Vocaris II, due to be released in September of this year.

The Vocaris is a portable PC which exploits Continuously Variable Speech Modulation (CVSM) technology capable of up to five minutes of continuous sampled speech with a quality similar to a telephone receiver. The speech quality is variable. If it is necessary to increase the quality, greater memory is required and the duration is consequently decreased. Speech on the Vocaris arrives by way of a digital sound processing chip. Words are created by linking digitised phonemes together according to the rule base. Initially speech is 'recorded' by breaking down the input into its basic phonetic elements. The sound chip takes care of the arrangement of elements when the words are to be created.

'What makes this system unique', says Crow, 'is its ability to interface to other computers, like the Atari, to make use of the powerful memory and audio features.' For further information, contact The Rehabilitation Equipment Centre, 5 Linton St, Melbourne 3189 Vic; (03) 532 0611.

For a machine to learn the way we do, it requires a construction similar to the way our own grey cells are arranged.

The IBM school has continued to be oblivious to the less usual functions of PCs. The bulk of sound, music and speech facilities have come from the Atari, Amiga and Mac schools. The Mac II, for example, sports the Apple Sound Chip capable of 'four-voice stereo sound using wave table synthesis and digital sampling at a rate of 44.1KHz' (so sayeth the manual). I've had the pleasure of using various public domain speech software on the Mac over the years, but nothing that has caused more than minor excitement. Potentially, though, the sound chip on the II range is impressive. No doubt great things are under way in the third party arena.

The Amiga has a propriety chip called 'Paula' which is dedicated to sound facilities. What really impresses, though, is the speech synthesis facilities built into the operating system, Amiga DOS. All files are of the same type on the Amiga. The speech facilities have been arranged such that any file can be output to the speech synthesis chip in the same way as directing output to any standard I/O device such as a printer.

Sampling is available on both the Amiga and the Atari at similar rates (around 28KHz). According to Tony Cuffe, Product Development Manager at Commodore, there are several third party products on the market for the Amiga. These are mostly used for musical effects, though not necessarily. A separate analogue to digital converter is required (usually supplied with the software) for connection to the parallel port. □

AutoSketch

Your Precision Drawing Tool

AutoSketch is a full function, precision drawing tool from Autodesk Australia for professional or educational use.

It's cost-effective, fast, powerful and simple to learn; pulldown menus and dialogue boxes help you each step of the way.

AutoSketch is also great for doing flow charts and office layout design. With the click of a mouse, you can draw copy, mirror or move objects, even create symbol libraries. AutoSketch automatically re-calculates dimensions as you edit.

You can even change your mind, delete and then restore, right back to your commencement point if necessary by utilizing the undo or redo commands.

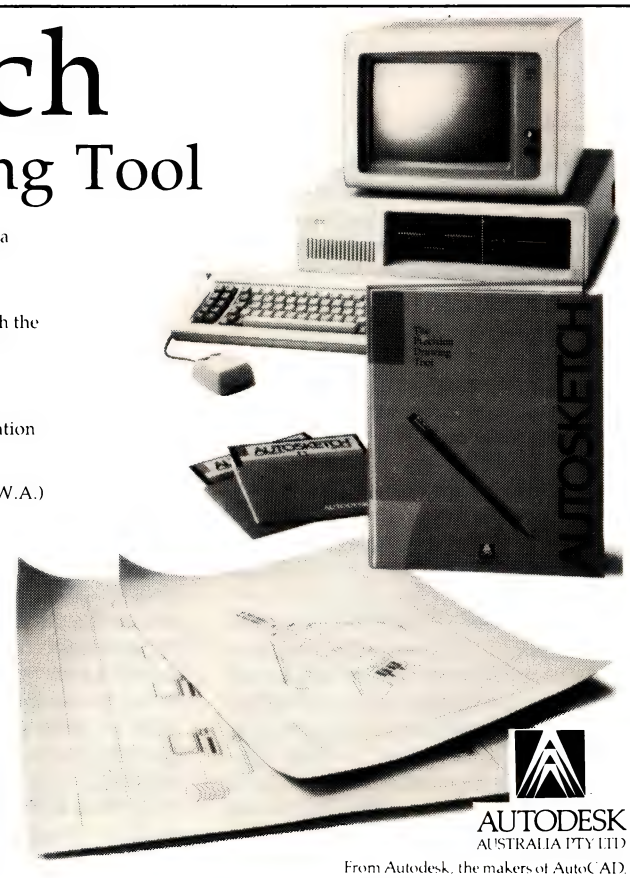
Fill in the coupon below for a FREE Demonstration Disk and other information about AutoSketch. Send it to the distributor listed below.

ADT COMPUTER SERVICES PTY. LTD.
(N.S.W., VIC., S.A., TAS.)
20 Commercial Road,
Melbourne VIC 3004
PH: (03) 820 2311 FAX: (03) 820 2141

CADD DISTRIBUTORS (W.A.)
921 Albany Highway,
Victoria Park Perth 6100
PH: (09) 470 2144
FAX: (09) 470 2145

YES, PLEASE SEND ME:
☐ MY FREE DEMO DISK (IBM COMPATIBLE DISKETTE)
☐ OTHER LITERATURE ON AUTOSKETCH
Name: _____
Title: _____
Company: _____
Address: _____
Postcode: _____ Telephone: _____

FREE OFFER



AUTODESK
AUSTRALIA PTY LTD
From Autodesk, the makers of AutoCAD.

NO KIDDING!
$3,000,000 PC STOCK READY TO GO!

says Ugly Dave Gray

AT LAST! FROM WAREHOUSE TO YOU IN 24 HOURS

After five months of installing our computerised warehouse stock system we can now guarantee immediate delivery.

PRINTERS/ PLOTTERS	4P PRICE*	SUPER TRADER
Epson		
LX 800	399	429
LQ 500	599	639
FX 1050	965	995
LQ 1050	1239	1295
LQ 2500+	1810	1970
GQ 3500	2695	2795
NEC		
P5200	895	955
P5300	1295	1375
Toshiba		
P321SL	955	995
P341SL	1212	1245
P351SX	1820	1879
Roland		
DXY 1100	1570	1670
DXY 1200	1964	2090
DXY 1300	2750	2925
SYSTEMS		
Epson		
PCe, 40 Mb, mono	2695	2795
PCe, 40 Mb, EGA	3295	3450
PCe, 40 Mb, VGA	3895	4150
AX2, 20 Mb, mono	2995	3150
AX2, 40 Mb, mono	3195	3350

Epson systems contain Miniscribe hard disks; Mono monitors are Eizo; color monitors are TVM or Intra. NOTE: The Computer Trader is an authorised Epson warranty service centre.

NEC		
Powermate 1, VGA, Multisync II, 20 Mb	5268	5488
Powermate 1 Plus, VGA, Multisync II, 42 Mb	5917	6164
Powermate SX, VGA, Multisync II, 42 Mb	7674	7994

NEC systems include 12 months NEC on-site warranty.

LAPTOPS	4P PRICE	SUPER TRADER
Bondwell		
XT 20 Mb with modem	3665	3795
SPECIAL 286 20 Mb with modem	4369	4645
Toshiba		
T1200 FF, dual floppy	2439	2525
T1200 HB, 20 Mb, B/lit	4740	4836
T5100, 80386, 40 Mb	8892	9072
SOFTWARE		
Lotus 1-2-3	570	594
Lotus Symphony	869	899
Lotus Freelance+	645	675
Lotus Manuscript	645	675
Lotus Agenda	499	520
Lotus Graphwriter	645	675
WordPerfect V 5	550	565
WordStar Professional V 5	336	350
MultiMate Advantage II	595	615
MS Word V 4 (inc. PageView)	459	478
MS Excel	578	602
MS Works	238	253
dBase IV	876	899
Paradox V 3	759	789
Framework III	845	865
HARDWARE		
Plus Hardcard, 40 Mb	1265	1315
Hyperam AT – 512 K	840	894
Hyperam 286 – 2 Mb	2213	2354
Intel Inboard PC386	1425	1485
Intel Aboveboard Plus, 512 K	1110	1175
Colorado Jumbo 40/60 Mb Int tape	652	693
Colorado Jumbo 40/60 Ext tape	904	962

4P is The Computer Trader's Preferential Price Performance Plan which guarantees huge savings on all your personal computing purchases.

* Supply may be subject to availability of stock from supplier.
* All prices include tax where applicable.

EPSON DEALER of the YEAR

PE30 & 880/890 dealer

MELBOURNE: 98 Hoddle Street, Abbotsford 3067. Tel: 417 7044. Government – Tel: 416 14 88

SYDNEY: 261 Broadway 2007. Tel: 552 1755. Government – Tel: 552 2911

ACT: Suite 203, 2nd Floor, 13 London Circuit, Canberra 2601. Tel: 57 4227

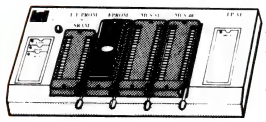
The Computer Trader

TCT 949

RODIRVING ELECTRONICS

NEW NEW NEW NEW NEW NEW NEW

MULTI-CHIP PROGRAMMER CARD



- Model LP-A1
- Module: Multi-Chip
- Good for programming
- SRAM TEST 6116-62256
- EPROM 8 BIT ICs
- 2716-27512, 2716A-27512A, 27012-27012, 27C16-27C512, 2804-5,8064, 28256-52B13
- EPROM 16 BIT ICs
- 271024, 27102, 27210
- MCS-48 series of ICs
- 8741-8750, 8748-8748H, 8749-8749H
- MCS-51 series of ICs. 8751-8752

X18020.....Only $575

MIDI INTERFACE CARD - DS/401

The MIDI DS-401 Card is the PC standard MIDI interface that runs most popular PC music programs for sequencing, recording, composing, music printing, patch editing, music instruction and many other applications.

- Run all programs designed for the Roland MPU-401 architecture
- Socketed EPROM for easy user replacement
- 1/3 length (short) card will fit in any computer accepting standard expansion card, including laptops
- Including "Y" cable, external connector box to transport is unnecessary

X18164.....$195

MOTHERBOARDS

10 MHz XT* TURBO MOTHERBOARD

Increase the performance of you sluggish XT* approximately four times with this super fast motherboard.

- 8088-2 running at 10 MHz, no wait state
- Turbo/ Normal selectable
- 640K
- 8 Expansion slots
- 4 Channel DMA
- Keyboard port

Excluding RAM
X18032.....$199
Including RAM
X18033.....$570

BABY AT* MOTHERBOARD (WITHOUT MEMORY)

- 6/12 MHz system clock with zero wait state. 12 MHz, 1 wait state
- 80286-12 Microprocessor
- Hardware and software switchable
- Socket for 80287 numeric data co-processor
- 64K ROM
- Phoenix BIOS or Award
- 8 Expansion slots

Excluding Ram
X18202.....$575
Including 2M/Byte Ram
X18201.....$1,325

386 MAIN BOARD

- Intel 80386 CPU (20 MHz)
- Socket for 80387 Math co-processor
- 32 bit Memory BUS system
- Built-in speaker attachment
- Battery backup for CMOS configuration table and real time clock
- Keyboard controller and attachment
- 7 Channel DMA
- 16 Level interrupts
- 3 Programmable timers
- 8 System expansion I/O slots: 5 with a 36 pin and a 62 pin expansion slots / 2 with only the 62 pin expansion slot / 1 with two 62 pin expansion slots (32 bit BUS)

Without RAM
X18103.....$2,390
Including 2 M/Byte RAM
X18107.....$3,500

TEST CARD

POSTCARD DIAGNOSTIC MODULE

Pinpointing component problems in IBM* compatible motherboards can take hours. Usually the whole system has to be working to isolate the troubled area. But not so with the new Postcard Diagnostic Module. So no other cards are necessary to test a bare motherboard.
"It now only takes seconds."
Simplified debugging for:

- Field service- for on-site repairs or maintenance depot work
- Manufacturing test- for burn in test flaws and to do quality control
- Inspection- Postcard simplifies incoming and outgoing test processes on stand

X18048.....$849

RAM

SUPER FAST DYNAMIC RAM

- 4164-120ns
U20832.....$4.25
- 4464-100ns
U20842.....$17.85
- 41256-80ns
U48262.....$14.95
- 41256-100ns
U48260.....$14.30
- 1MB-100ns
U48265.....$35

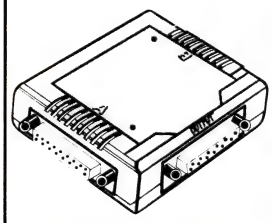
NEW CARD

G7 MONOCHROME COLOUR CARD

- IBM* Colour Graphics Adapter compatible (support 600 x 200 four colour graphics model)
- IBM* Monochrome Display Adaptor compatible
- Hercules Monochrome Graphics Adaptor Compatible
- IBM* Printer Adapter compatible
- Support Composite Monochrome monitors
- The G7 Monochrome colour card requires - an IBM* PC/XT/AT or compatible computer system and a monitor

X18007.....$139

I/O ACCESSORIES



POCKET AUTO AB SWITCHES

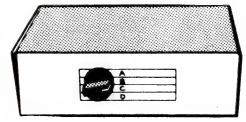
- Pocket size, auto-scanning
- Allows 2 PCs to share one laser
- Serial model: MS-201 - Host- powered

X19150.....$79.95

POCKET AUTO AB SWITCHES

- Pocket size, auto-scanning
- Allows 2 PC's to share one laser
- Parallel model: MP-201 - Protocol transparent

X19155.....$89.95



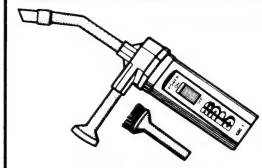
DATA TRANSFER SWITCHES

If you have two or four compatible devices that need to share a third or fifth, then these inexpensive data transfer switches will save you the time and hassle of constantly changing cables and leads around.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector

2 Way RS232
X19120.....$69
4 Way RS232
X19125.....$79
2 Way Centronics
X19130.....$69
4 Way Centronics
X19135.....$79
RS232 2 X 2 Crossover
X19140.....$79
Centronics 2 x 2 Crossover
X19145.....$79

P.C ACCESSORIES

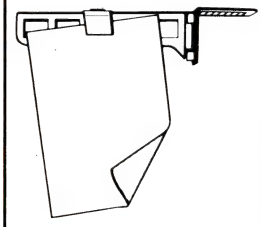


MINI VACUUM CLEANER

Use it to clean:

- Computer keyboards
- Printers
- Video recorders
- Computer circuit boards

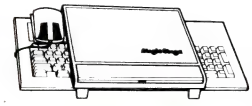
C21087.....$14.95



GRIP CLIP COPY HOLDER

- Attaches to the top of your monitor
- Put your copy right where you need it spring clip to hold paper
- Velcro at mount for easy removal

C21065.....$14.95



MAGIC STAGE

A working bench for your Mouse.

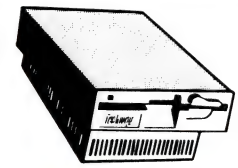
- High quality ABS plastic and anti-static rubberised top
- Stationary holder
- Includes pull-out shelf for Mouse
- Dimensions: 280 x 260 x 25mm
- Fits over keyboard

C21080.....$24.95

DON'T FORGET OUR DEALER IN ADELAIDE

ELECTRONIC DISCOUNTERS
PH: (08) 212 1799
305 Morphett St.
"Adelaide"

DISK DRIVES

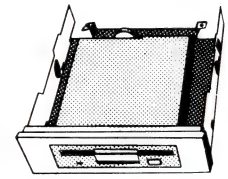


EXTERNAL PS/2* COMPATIBLE 5 1/4" DISK DRIVES

Capacity: 360K
Track/Disk: 40
MTBF: Greater 10,000 hours
MTTR: 30 min. or less

- External 37 pin connector cable
- Internal 40 pin adaptor cable for PS/2 models
- 40 pin card edge
- Installation Guide

C11907.....$495



3 1/2" 1.44 M/BYTE DRIVE

- Switchable 1.44 M/Byte formatted or 720K formatted
- Double sided, Double density
- 5 1/4" mounted

C11911.....$225

CONTROLLER CARD TO SUIT
X18006.....$139

MOUNT WITH POWER CABLE ONLY
X11920.....$19.95

HARD DISKS

20 M/BYTE HARD DISK

- Drive with controller card, IBM* compatible, 12 month warranty

X20010.....only $449

40 M/BYTE VOICE COIL HARD DISK

- IBM* compatible, 28 msec access, 12 month warranty

Without controller...$895

80 M/BYTE VOICE COIL HARD DISK

- IBM* compatible, 25 msec access, 12 month warranty

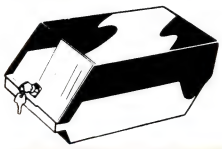
Without controller.$1,595

330 M/BYTE VOICE COIL HARD DISK

- IBM* compatible, 18 msec access, ESDI,12 month warranty

Without controller.$3,200

DISK BOXES



DISK STORAGE UNITS

- 80 x 3 1/2" - Lockable
C16038.....$16.95
- 40 x 3 1/2 "- Lockable
C16035.....$14.95
- 50 x 5 1/4 "- Lockable
C16025.....$14.95
- 100 x 5 1/4 "- Lockable
C16020.....$15.95
- 120 x 5 1/4 "- Lockable
C16028.....$19.95

ROD IRVING ELECTRONICS

All sales tax exempt orders and wholesale inquiries to:

SYDNEY: 74 Parramatta Rd.
Stanmore 2048
Phone: (02) 519 3134
Fax: (02) 519 3868

MELBOURNE: 48 A'Beckett St
Phone: (03) 663 6151

NORTHCOTE: 425 High St.
Phone: (03) 489 8866

ADELAIDE:
(Electronic Discounters)
305 Morphett St. Adelaide
Phone: (08) 212 1799

MAIL ORDER & CORRESPONDENCE:
P.O. Box 620, CLAYTON 3168
Order Hotline: 008 33 5757
(Toll free, strictly orders only)
Inquiries: (03) 543 7877
Telex: AA 151938
Fax: (03) 543 2648

RITRONICS WHOLESALE:
56 Renver Road, Clayton.
Phone:(03) 543 2166 (3 lines)
Fax: (03) 543 2648

ORDER HOTLINE
008 33 5757
(TOLL FREE)
STRICTLY ORDERS ONLY

LOCAL ORDERS & INQUIRES
(03) 543 7877

POSTAGE RATES:

$1 - $9.99	$2.00
$10 - $24.99	$3.00
$25 - $49.99	$4.00
$50 - $99.99	$5.00
$100 +	$7.50

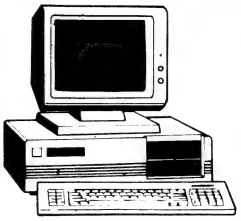
The above postage rates are for basic postage only. Road Freight, bulky and fragile items will be charged at different rates.

Errors and omissions excepted. Prices and specifications subject to change.

IBM*, PC*, XT*, AT*, are registered trademarks of International Business Machines. *Apple is a registered trademark. Teflon* is a registered trademark of Dupont. *Denontes registered trademarks of their respective owners.

MasterCard VISA

COMPUTERS & ACCESSORIES



IBM* XT* 640K RAM TURBO COMPATIBLE COMPUTER

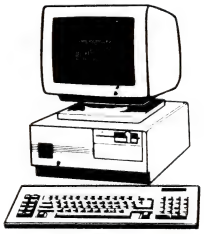
Check these features and our prices. We're sure you'll agree they're exceptional value for money!
- Final assembling and testing in Australia!
- Fast TURBO Motherboard
- AT* style keyboard
- Tested by us for 24 hours prior to delivery!
- 8 Slot motherboard
- 12 months warranty!
- 150W power supply

640K RAM TURBO COMPATIBLE COMPUTER

2 x 360K Disk Drives, Multi-function Card, Colour Graphics, Disk Controller, 1 Serial, Parallel Port (Clock).....**$1,195**

WITH 20 M/BYTE HARD DISK:
& single 360K Disk Drive..$1,495
& dual 360K Disk Drives...$1,695

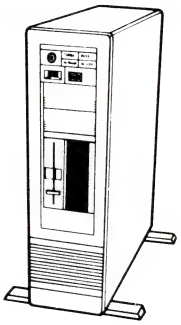
WITH 40 M/BYTE HARD DISK:
& single 360K V.C. H.D.....$2,095
& dual 360K V.C. H.D.....$2,295



BABY AT* COMPATIBLE COMPUTER!
2M/B RAM $2,695

- Final assembling and testing in Australia!
- 4 M/Byte Main Board, 2 M/Byte fitted
- Switchable 8/10/12 MHz
- 1.2 M/Byte Floppy Disk Drive
- 80286 CPU
- Colour Graphics Display Card
- 8 Slots
- Floppy & Hard Disk Controller
- Printer Card and RS232
- Keyboard
- 200W Power Supply
- Manual
- 6 Months Warranty
- Size:
360(W) x 175(H) x 405(D)mm

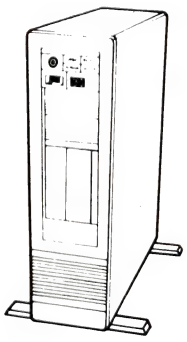
With 20 M/Byte Hard Disk.$2,195
With 40 M/Byte V.C. H.D....$2,395
With 80 M/Byte Hard Disk..CALL



386 TOWER PC

The 386 Tower PC is a high performance system that's IBM* AT* compatible. However, the 386 Tower PC gives you 2-5 times the performance.
FEATURES:
- Intel 80386-16MHz microprocessor
- Switchable 16/20 MHz
- 2 M/Byte fitted. Total memory expandable up to 16 M/Byte
- Up to 2 M/Byte or 8 M/Byte RAM modules on system board or on RAM card
- Option for 80287 & 80387 co-processor socket
- Operates in page mode with interleave memory subsystem
- Shadow RAM supported to allow system BIOS to be executed on system memory instead of slower EPROM
- Four 16-bit I/O slot. Three 8-bit I/O slot, and one 32-bit memory slot
- 8042 keyboard controller interface for AT* compatible keyboard
- Seven direct memory access (DMA) channels
- Chips and Technology chip set
- AMI 386 BIOS/ Phoenix 386 BIOS/ AWARD 386 BIOS (AMI fitted)
- 50 M/Byte hard disk. 42 M/Byte formatted. Voice Coil
- EGA card
- 3 1/2" drive 1.44 M/Byte

X20070.....$5,995



TOWER COMPUTER CASING

Remount your computer to give it that professional look.
- Accepts XT, AT, Baby AT and 386 boards
- Horizontal full height hard disk drive mounting
- Room for 2 x3 1/2" and 2 x 5 1/4" floppy drives
- Full height HDD plus fan mount
- Size: 165(W) x 600(H) x 500(D)

X11105.....$295

NEW DISKS

VERBATIM DATALIFE PLUS
Teflon* Coated
(ALL PRICES PER BOX OF 10 DISKS)
5 1/4" DS/DD
C12522.....$34
5 /14" High Density
C12523.....$64.95

"NO BRAND" DISKS

Now you can buy absolute top quality disks that are also the cheapest in Australia! They even come with a lifetime warranty, which indicates the quality of these disks. So why pay 2-3 times the price for the same quality?
Packs of 10, D/S D/D without boxes, or brand name, just their whitepaper jacket, and index label. (5 1/4" disks includes write protects)

5 1/4" 2S/2D "NO BRAND" DISKS

10+ DISKS	100+ DISKS	1,000+ DISKS
$6.50ea	$6.25ea	$6.00ea

5 1/4" HIGH DENSITY DISKS
(DOUBLE SIDED)

10+ DISKS	100+ DISKS	1,000+ DISKS
$21ea	$20ea	$19ea

3 1/2" 2S/2D "NO BRAND" DISKS
Suitable for IBM, PS/2, Macintosh, Atari, etc.
$21
(ALL PRICES PER 10 DISKS)

VERBATIM DISKS
(ALL PRICES PER BOX OF 10 DISKS)

DESCRIPTION	1-9 BOXES	10+ BOXES
3 1/2" 1S/2D	$39.95	$37.95
3 1/2" 2S/2D	$46.95	$43.95
3 1/2" 2S/HD	$99.00	$89.00
5 1/4" 1S/2D	$22.00	$21.00
5 1/4" 2S/2D	$26.00	$24.00
5 1/4" 2S/4D	$75.00	$70.00
5 1/4" 2S/HD	$41.00	$39.00

ROD IRVING ELECTRONICS

MCA ON THE ROAD

IBM S PORTABLE P70

IBM's new P70 is their best attempt yet at portable power, but it's more of a transportable than a laptop, says Paul Zucker.

IT SEEMS THAT one of the most popular things to do in this industry is speculate on what IBM 'has in the box.' If my count is right, this is the third portable IBM PC. We waited for the first luggable which was basically an XT in a portable 'sewing machine' case. If you want one I think Tech Rentals still have a few for sale. Next there was the 'Convertible.' This came after almost a year of speculation that IBM was going after some of the big contracts like the US Internal Revenue service with a possibility of sales of tens of thousands. Well, what a non-event that was. It offered new features – like no standard serial or parallel ports. What it didn't offer was any reason for buying it apart from the name and even that didn't sell many. Once again it's available at bargain basement prices around town.

Now IBM has a new standard architecture. (Well, almost, apart from a couple of old standard machines which I'm not knocking because they certainly fill a market need.) The Model P70 is the first IBM portable with Microchannel architecture (MCA) – all 1.5 slots of it. I emphasis that because I can't see what difference the architecture makes if you aren't using expansion cards.

Why a portable?

UNLESS YOU'VE ever felt the urge, you might wonder why anyone would want a portable. I suppose there are those who wonder why anyone would want a desk-bound machine. First the distinction (in my mind) between the two types of machines. The first is the true portable. It's meant to be used on the move – on your lap in the park, perched on the clients reception desk and in the classroom. It's got to be a battery powered machine and so far that means monochrome, LCD screens with the inherent limitations of the long persistence.

The other type of portable is the relocatable or transportable or luggable machine. That's what the original IBM portable was. These are relatively self-contained machines which can be packed up and moved to another location. They needn't suffer from cuts in speed, disk capacity and so on because they are larger and use mains power. They often have a couple of expansion slots, more ports than a battery machine and sometimes an expansion chassis that holds more cards and ports.

It's a personal thing, but I get annoyed at the use of the term 'laptop' for transportables. Unless it runs on internal batteries or comes with a pocket AC generator you'd hardly expect to use it on your lap. Ever sat a Toshiba 5200 on your knee? It might be *YC's* Computer Of The Year, but knee-compatible it's not. I'm typing this story on a transportable at the moment – from choice not necessity, so I'm one of those who can see a need for that type of machine. For that reason alone, IBM will sell its P70. There is a market for powerful machines that can be moved without drama and a couple of tame native bearers.

What machine am I using and why isn't it the IBM? It's an NEC PowerMate Portable SX which is a 386sx-powered machine. At 16MHz it's a reasonable machine to compare the IBM with. And why aren't I writing this on the IBM? Because it's moved on already. Time waits for no journalists. Anyway, on with the story...

Looks and layout

THIS IS A clean-lined machine. Unlike some traditional transportables, it doesn't have that sewing machine shape. Instead it looks more like a stylish attache case. This is partly due to the need to accommodate what must be one of the largest keyboards on a current portable. As well, the smaller MCA expansion cards allow a slimmer design for a 'two card' machine. Its actual dimensions are 464mm wide by 305 high by 128 deep, which holds some 9kg of machine.

The keyboard is held by two unnatural slide catches. They don't work the way you expect and they don't catch automati- when you close the machine. That's probably good because you are forced to manually secure the keyboard and believe me, its very embarrassing when the keyboard falls of the machine just as go to get on the 5:10 out of Wynyard. Some of you will be dismayed at the small Enter key on this and other current IBM machines.

Once the keyboard is down, the diskette drive falls open. It's a strange arrangement but was presumably necessitated by the lack of depth for horizontal mounting in the slim unit. Unlike many portables with detachable keyboards (including the NEC I'm using now) you aren't left with the need to find extra desk space if you don't need to – the keyboard stays nicely clipped onto the case at a good angle for typing but the lead is quite generous and there are fold-out feet for those who want their personal screen/keyboard juxtaposition. It's easy to think that designers haven't spent much time on new machines (especially the human engineering side) but when you notice little things like the fact that replacing the keyboard and shutting the P70 turns off the mains, it makes you realise how much the designers thought about how you'll use it. (Pity if

you didn't want it turned off just at that moment. I guess it must be alright to turn hard disks off regardless of what they're doing at the time!)

Strangely, the mouse connects at the back, next to the other ports. I would have like to have see either a keyboard port (but that would mean non-compatible keyboards) or one somewhere on the front panel, perhaps near the diskette drive. If you're a Windows user or even use a mouse with other software, you'll find the 'mickeys per inch' ratio bad on the IBM mouse. You need half a desk justto navigate around the screen. I presume it can be software configured though. While I'm on the mouse – it would have been nice to have provided a cubby hole for the mouse and mains cord in the unit. It's so embarrassing walking to your car carrying the portable, lead around your neck like a punk tie, and the mouse in your trouser pocket. (Is that a mouse in your pocket or are you. . .)

The back panel has a little slide cover that reveals the ports and that's in turn mounted on a hinge-out panel that gives access to the expansion card connector plates. Three captive screws hold on the whole back cover which you only need to remove for installation of cards, co-processor or extra memory. And I wish IBM could get rid of those inflexible, massive power cords. Obviously they can build more user-friendly ones yet still stay within the Australian standard.

Here's looking at you

'THE SCREEN!,' I hear you say. Well, it seems to be typical of gas plasma screens – sort of bright orange in a sea of darker orange. It's true VGA and it displays 16 grey levels for either colour simulation or enhanced monochrome applications. It does quite well if you don't tell the application you've only got mono. As a matter of fact, you'll usually get a more usable result if you don't say anything – especially where it's an EGA or CGA driver. Unlike LCD screens which smear and can't really support a mouse, the plasma screens such as on this machine, are well suited to mouse applications like DTP and Cad.

I liked the easy way it stayed at whatever angle you placed it, too. I didn't like the fact that the screen saver would turn the screen off even in the middle of scrolling a screen or watching a demo. And for some reason the screen's brightness and contrast are software configurable.

What can you say about performance? So much depends on what software you have, what operating system, how much cache, how you organise your disk. As far as raw speed, I suppose a Norton SI ratings gives some idea. I couldn't get SI to recognise the hard disk (under OS/2 Dos box) but it gave an SI of 21.3. When I booted the machine under generic Dos 3.3 it gave an SI of 21.5 and that may give an indication that the Dos box under OS/2 doesn't markedly affect performance.

I was surprised by the 'password' protection that comes with the P70. It won't let you do anything with the machine unless you know the word. Even changing the password requires you to know the old one. Sound secure? Well it isn't because you only have to remove the set-up battery for 20 minutes and the machine can be started up without a password.

O/S who?

I MAY AS well admit that I didn't exhaustively test this machine's OS/2 as I'm not OS/2 literate yet; I don't have any OS/2-only applications; I don't know of anyone who uses O/S2 on a single user system (apart from Les Bell and you can't count anyone who has a network in their bedroom!); and I can't see why you'd want to run OS/2 on a portable. The few applications that were loaded worked well enough and the Dos box worked with most applications. Where it didn't work could have been my fault for not setting things up correctly .I can see that I'll have to come to grips with this OS/2 thing.

When you compare IBM manuals with those pitiful excuses you get with some Asian machines, you realise that IBM can produce excellent manuals. Sometimes, though, I wish they'd give you two sets – one simplistic set for the tyros, and a solid reference set for the person who's done it before and just needs the 'facts m'am – just the facts.' They're good but they are a bit tedious.

Conclusion

THE P70 is in no way a ground breaking machine. It's in almost all respects a me-too machine, but we can't all be the first, and it's important for IBM that they've made a solid, workable machine with sufficient market to make it worth having on the price list. Unlike those portables that 'dock' onto a fixed expansion/connector chassis, the P70 isn't easily moved from your desk at night if it's connected to, say, an external monitor, modem, lan, printer and so on. The extra couple of minutes will sometimes make the difference between taking it home to work on and not.

For all those people who complain about the weight of machines like this I say that you get what you get. That's how much the machine weighs and if it's too heavy you should've bought something else. In the next couple of years we'll see this sort of machine get lighter but compared to the weight of an equivalent desktop PC, keyboard and monitor it's not too bad.

I can't see why this machine should flop and with it's creditable performance it should satisfy many buyers. Whether buyers will need the MCA feature is a moot point, but that badge will always sell to a proportion of the marketplace. Applying the 'would you use one?' test, I'd say 'Yes! I would.' □

In the box

IT'S EASY TO to be glib about the performance of machines nowadays. To say that P70 machine is only half as fast as the new 33MHz Compaq or even slower when compared to the first 486 machines which have been announced, let's remember that this machine is around ten times as fast as it's predecessor IBM transportable. A machine like this is a powerhouse and is ideally suited to processor hogging applications like DTP. In the box we have –

80386 processor running at 20MHz;
Single 3½ inch 1.44Mb diskette drive;
Internal 60 or 120Mb hard disk;
Plasma VGA screen (640 x 480);
External VGA monitor port;
25-pin serial port;
Parallel printer port;
4Mb Ram (expandable to 16);
Optional 80387 co-processor;
One full and one half-length expansion slot;
Mouse port and mouse; and
Full-size keyboard.

Product Details

Product: IBM P70 portable
Distributor: IBM Australia
(02) 680 9111
Price: $12,633 60Mb hard disk
$13,616 120Mb

. . .when you notice little things like the fact that replacing the keyboard and shutting the P70 turns off the mains, it makes you realise how much the designers thought about how you'll use it.

AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST

The ultimate in sophisticated golf reporting, colourful profiles, dramatic pictorial and penetrating expert instruction . . .

AUSTRALIAN GOLF DIGEST

COMPULSIVE READING

Available Monthly at your newsagent or subscribe now by phoning (02) 693-9517 or 693-9515

AUSTRALIA'S TOP SELLING GOLF MAGAZINE

AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST

AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST • AUSTRALIAN GOLF DIGEST

OKI

MICROLINE PRINTERS

Save $ $ $

SUPERB PERFORMANCE AT AFFORDABLE PRICES

Suit IBM, IBM Compatibles, PC, XT, AT, Commodore PC's, AMIGA, Atari, Microbee, ICL, NEC, NCR, PRIME

WORD PROCESSING, GRAPHICS, ACCOUNTS REPORTING

FEATURES: Draft, NLQ Print, bit map graphics, menu select, rear and bottom feed, colour

182	9PIN	120cps	30NLQ	80col
183	9PIN	120cps	30NLQ	136col
292	18PIN	300cps	100NLQ	80col COLOUR
293	18PIN	300cps	100NLQ	136col COLOUR
390	24PIN	270cps	90LQ	80col
391	24PIN	270cps	90LQ	136col
393	24PIN	450cps	120LQ	136col

★ ★ ★ **NEW** ★ ★ ★

320	9PIN	300cps	63NLQ	80col
321	9PIN	300cps	63NLQ	136col

Service-Ribbons-Toners-Printheads

RIBBONS, ROLLS & PRINTERS PTY LTD
99 New Illawarra Road,
BEXLEY NORTH, NSW 2207

Ph: (02) 507 663 Fax (02) 50 6854

Avo Electronic Systems
188-192 Pacific Hwy,
(cnr. Bellevue Ave.,)
Greenwich, N.S.W. 2065

STORAGE

20 MB Harddisk & Card	$438.00
33 MB Harddisk & Card	$539.00
42 MB Harddisk & Card	$599.00
720K 3.5" FDD	$165.00
1.44M 3.5" FDD	$195.00

ACCESSORIES

12" x 12" Digitizer	$849.00
Key Board Draw	$75.00
Mouse with Software	$80.00
Disket Storage Box	$18.00
Quickshot Joystick	$28.00

DISPLAY

Dual mode card	$108.00
EGA Card	$280.00
VEGA VGA card	$499.00
Dual mode monitor	$180.00
Thomson 14" Colour	$450.00
Thomson 14" EGA Mon	$630.00
Thomson VGA Mon	$720.00

PRINTER

10" 9 Pins NLQ	$395.00
15" 9 Pins NLQ	$599.00
10" 24 Pins NLQ	$615.00
15" 24 Pins NLQ	$1380.00

PC XT
640 KB RAM
101 KEYS KB
360 KB FDD
20 MBB HDD
BONUS
TTL MON
$1,399

PC AT
LM = 16 MHZ
12 MB FDD
42 MB HDD
EGA CARD
BONUS
EGA MON
$2,680

PC XT
101 KEYS KB
360 KB FDD
32 MB FDD
NLQ PRINTER
BONUS
TTL MON
$1,999

PC AT
20 MHZ 1MB RAM
40 MB VC HDD
VGA CARD
MULTISYNC MON
$3,620

Training, installation and problem solving specialist
Reliable repair and service by qualified engineer
Full 12 months parts and labour warranty

Introducing 386 PC 20MHZ 2MB RAM FROM $4628

Tel: (02) 906-2655 Fax: (02) 906-2735

DTP ADVISOR – GOOD ADVICE?

Is DTP Advisor a desktop publishing tutorial, a project management system or a case of computerisation for computerisation's sake? Stewart Fist attempts to find out. . .

I RECENTLY SPENT a couple of days at Wollongong University attending the Pacific University Consortium Conference, so I'm up to my eyeballs in information about the coming 'Age of Multimedia', and the gee-whiz hype about CAI (Computer Aided Instruction, for all you plebs).

I wish I weren't so cynical – but I've heard it all before. You've got no idea how enthusiastic we all were in the late 1960s about educational CATV (cable television), and our joy knew no bounds when the first half-inch black and white video Portapaks appeared on the scene. But that was nothing to the excitement of interactive video when Philips first showed LaserVision. Anyone styling themselves an 'educational technologist' had an emotional relationship with LaserVision which was almost obscene: videodisk was clearly the answer to the world's education problems. This was all BC (before computers).

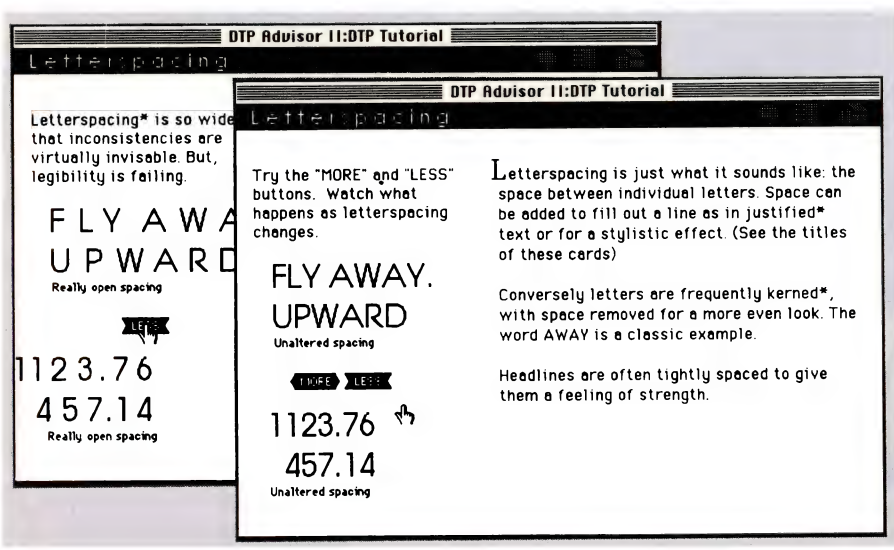
So it was with a rather jaundiced eye that I returned from Wollongong to find a copy of Broderbund's DTP Advisor on my desk for review. One glance at the box was enough to send shudders down my spine: it was billed as a 'Productivity Tool' with a side-bar explaining that it was a 'desktop publishing tutorial and project management system.'

Opening the box was a pleasant surprise – only two disks and a very thin manual. I have this theory, see, expressed as the Fist Inverse Manual Law which says 'The thinner the manual, the better the program'. So at this stage the manual-thickness was the best thing the program had going for it. The disks turned out to be a few HyperCard stacks which again lifted my spirits a little. I think HyperCard is probably the best program to use to tutorials and help systems – so by this time DTP Advisor was starting to look quite good.

When you get into the main tutorial (which is as simple as with any HyperCard stack) you find that DTP Advisor is actually two program modules in one. First of all you have the main tutorial which serves the basic educational function, and at the same time you have a set of forms which are generously entitled 'project management guidance tools.' As you work your way through the tutorial, you can drop out to an appropriate form, fill this in, then drop back into the tutorial again – both learning and doing at the same time.

Say, for instance, that you have just read the Card which tells you how to spell out your 'Primary, Secondary and Tertiary Objectives'. You then click on the buttons below, and you instantly get a chance to enter your own Objectives in suitably worded educational jargon. Then when you click on the Project Definition Forms button you will be presented with a full-page form with your new Objectives already inserted, and at this stage you are invited to add details like Audience, Strategies and Tactics thus creating the first strategy form for your next project.

All the jargon terms above will send a thrill through the hearts of Educationalists and shivers through the spines of real teachers. I've had the theory pounded into me hundreds of times, but I've never actually met anyone that works this way. The whole tutorial is structured like this. You learn a bit of theory, then get the opportunity to actually put your learning into practice using the preset form stack that comes as part of the package. After you've finished with the tutorial you simply use the forms stack direct, and the tutorial and glossary then become an extended Help system.



One of the better features of DTP Advisor are the 'live' demonstrations (of kerning, as shown here, for example) – by clicking on the appropriate button you can see the effect of 1-point, 2-point, and so on of leading, or the result of more or less letter-space on the appearance of the lines.

Project management

LET'S DEAL WITH these three aspects in reverse order. The project management forms provided are marginally better than those you could photocopy out of a reference book, mainly because the calcula-

tions have been automated. So, for instance, your Project Estimate Form gives you a check list of all the major costs associated with any printing project under the headings Fees (Designer, Illustrator and so on), Production (Typesetting, Retouching and so on), General (Travel, Xerox) and Printing.

You type in the per-hour rate and the number of units for each appropriate heading, click on the Calculate button and the sums are done for you. You can even compare actual expenditure with your original estimates to see how naive you were. Far be it for me to sneer at any process which saves me having to multiply and add – but we are only talking here about a dozen figures at the most. I am a certified numerical dyslexic, but I could do all these mathematical functions without a calculator. Using a 5.25 megabyte Mac IIx with the 68030 chip for this task is a touch of overkill.

Other forms provided in this section of the program are much the same, except that they utilise the power of the computer even less. Most of them are only word processor documents which you would probably fill in easier using biro on a photocopy. The only value I can see is that the forms provide lists of 'memory joggers'. As a subsection of this aspect, DTP Advisor also has a small database attached for names and addresses of Artists, Photographers, and so on. There's nothing special about this database – it keeps names and basic information, and it has a special search screen so that you can find the appropriate artist for the job at hand.

Tutorial content

THE SECOND major aspect is that of the tutorial content The program database provides details of basic printing, typesetting and layout. You learn what the 'x-height' of a type font is, how 'leading' is calculated, and get a lot of advice on the choices of type families, layout styles, paper types, and other goodies.

The tutorial was obviously written by an experienced print editor (Craig Sheumaker) who made the mistake of seeking 'expert' assistance from an educationalist. Consequently, you get the profound advice to set goals – not just one, but three (Primary, Secondary and Tertiary Objectives) and all the garbage that accompanies this 'scientific' approach. I'm amazed that there wasn't a long piece about Aims, as distinct from Objectives – educationalists can usually talk endlessly about these distinctions.

The authors also have a strange idea about the relative importance of their pronouncements – like: 'make sure that your promotional materials are seen by people that [sic] will indirectly aid in your success.' I looked in vain for the companion piece about motherhood and apple pie; it must have been the educationalist's day off! In general the tutorial information reminded me of the *Reader's Digest* – full of folksy wisdom, old-fashioned biases, and sometimes pure artistic rubbish all often dressed up in pseudo-scientific jargon. The authors still talk about 'cool and warm' colours in Freudian terms, and they recommend that 'women still tend to prefer softer colours printed on uncoated paper' as if it were Doctor Who's advice on dealing with Vogons.

After twenty years in the media, I have to declare that most of these definitive theories about layout, colour, typestyles and so on are pure crap. For every example they propose to support one particular theory, you'll find six that demonstrate the opposite. In fact, when it comes to layout, the only theory that does work for the novice is to copy what other, more experienced, graphic artists are doing. There's no science here, only fashion.

Some of the DTP Advisor instructions also borders on the ridiculous, for instance: 'The decision to illustrate or photograph rests on one of these issues: 1) Can this idea or thing be photographed? 2) Can an illustration show it better?' Gee! Really? I can only hazard a guess about how many words of instruction and how many illustrative illustrations there are in this tutorial, but there couldn't be more than about 10,000 words and, say, 50 important images – which would be about the amount you would find in four or five magazine articles. You'd find this amount of information in the first couple of chapters of a book, so there's not much copy here.

In these few words DTP Advisor also gives you advice on: selecting whether to use advertising ('A two-page spread has the most impact'), to an explanation as to how the silk-screen process works, to advice on participating in trade shows, and then data on making a professional video. It tries to cover the business communications universe, but predominantly it deals with printers, illustrators, layout artists and the like. This really isn't desktop publishing in my book. It is more like advice to a PR or Marketing Manager who needs to know a bit about printing and publishing to contract outside help.

This is not to say that it isn't helpful. It does provide condensed and encapsulated wisdom which would assist the novice – as would any good book on the subject at a darn-sight less than the $A125 this package costs. Which leads us to the last aspect. How well does HyperCard work as a tutorial?

Training functions

I'VE NOW HAD experience with a half-a-dozen or so HyperCard tutorials, and to date, I haven't found one that is significantly better than a book would be on the same subject. To qualify this a little: some aspects are sometimes better on HyperCard, but a lot of them are a lot better in print. The things that work here in DTP Advisor are examples of leading (the amount of space between the lines of text) and letter-space or kerning (the amount of space horizontally between letters). The authors have put up an example of text, and then by clicking on the appropriate button you can see the effect of 1-point, 2-point, and so on of leading, or the result of more or less letter-space on the appearance of the lines.

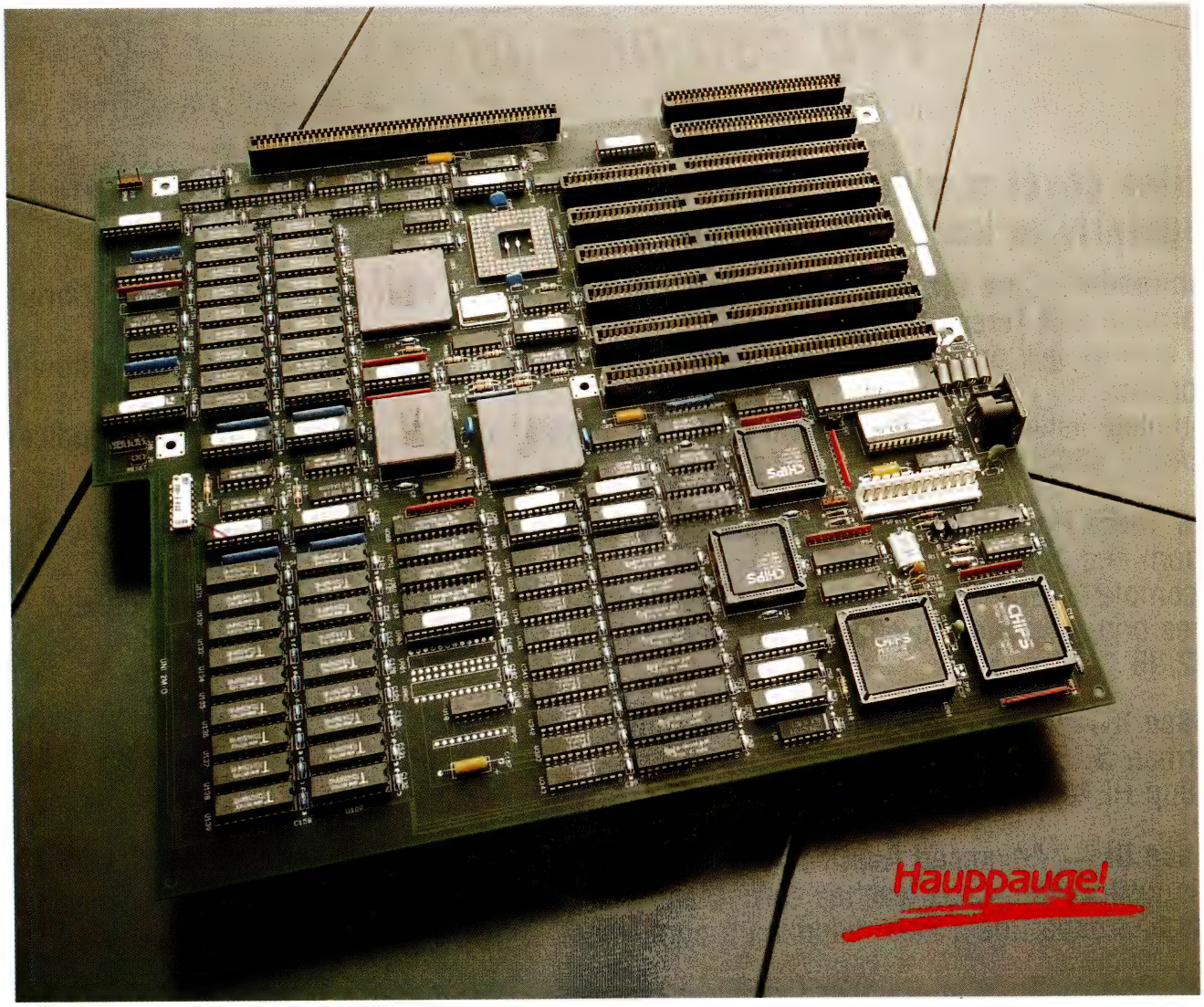
To sum it all up: the program is adequate and certainly will help anyone who needs to control a printing project while knowing next to nothing about how the process works. This is not desktop publishing in the do-it-yourself sense, and it is silly of Broderbund to pretend otherwise. Before you buy anything like this, I would suggest that you drop into your local book store and browse through these stacks. My guess it that you'll get something twice as good for half the price. After all, a well-written book with a good index is the best form of multimedia hypertext around – and it's in a convenient lap-top portable form. □

Product Details

Product: DTP Advisor
From: Broderbund
Distributor: Dataflow Computer Services, 134 Barcom Ave, Rushcutter's Bay 2011
(02) 331 6153
Price: $125

'This really isn't desktop publishing in my book. It is more like advice to a PR or Marketing Manager who needs to know a bit about printing and publishing to contract outside help.'

Western Computer



THE 33Mhz 386 MOTHERBOARD

NOW AVAILABLE IN AUSTRALIA!

FEATURES

- Designed and Manufactured by Hauppauge Computer Works Inc. in the U.S.A.
- **Intel 33Mhz 80386DX** Double Sigma 32-bit Qualified CPU
- **Intel 33Mhz 82385** cache memory controller chip
- 64k of 15 nanosecond static Ram for memory caching
- 4 megabytes of 80 nanosecond zero wait state, 4-way interleaved DRAM on motherboard
- Total memory expansion to **64 megabytes** with Hauppauge RAM card
- Award BIOS
- Full AT Formfit design
- One 8-bit expansion slot
- Six 8/16-bit expansion slots
- One 8/32-bit expansion slot (for Hauppauge Computer Works proprietary RAM card)
- Sockets for both **Weitek 3167** and **Intel 33Mhz 80387** maths co-processor
- Battery backed clock and calendar
- PC/AT compatible I/O and BIOS for support of OS/2

Contact

Western Computer
Australasia Pty. Ltd.

139 SANDGATE ROAD ALBION
BRISBANE QLD 4010

PH: (07) 262 3122
FAX: (07) 262 4957

OEM/DEALER ENQUIRIES WELCOME

your computer

You can now order any of these from the Your

Titles cover a wide range of computer topics and will be updated regularly to keep you informed of the latest trends.

Commodore Care Manual: Diagnosing and Maintaining Your 64 or 128 System: Chris Morrison and Teresa S. Stover
No special skill or knowledge are necessary — readers do not even need to know how to program.
Complete listings for the program modules, written in BASIC are given in the appendices.
HEA038 **$34.95**

The Turbo Pascal Trilogy: A Complete Library for Turbo Pascal Programmers: Eric P. Bloom and Jeremy G. Soybel
A complete Turbo Pascal tutorial, reference manual, and source code library. Actually three books in one, no other book offers a more complete treatment. 510pp HEA056 **$52.95**

dBase II — A comprehensive User's Manual
Kerman D. Bharucha
368pp HEA057 **$39.95**

dBase III — Advanced Applications for Non-programmers: Richard H. Baker
This well-written book teaches sorting and indexing, writing reports, assembling mailing lists and department files, handling orders, more. 448pp HEA058 **$39.95**

High Performance Interactive Graphics: Modelling, Rendering and Animating for IBM PCs and Compatibles: Lee Adams
Includes more than 50 working demonstration programs for creating realistic graphics on IBM and Apple compatible micros. 424pp HEA059 **$45.95**

The Illustrated Handbook of Desktop Publishing and Typesetting: Michael L. Kleper
Kleper provides 800 pages of analysis and how-to-information that cover the entire scope of this innovative technology. 784pp HEA060 **$59.95**

Framework II Applications — 2nd Edition: Richard H. Baker
336pp HEA041 **$39.95**

Interfacing and Digital Experiments with Your Apple: Charles J. Engelsher
352pp HEA039 **$29.95**

Turbo Pascal for the Mac: Programming with Business Applications: Dr. Leon A. Wortman
288pp HEA042 **$35.95**

BOOK SHOP

specially selected computer books Computer book shop.

Advanced Commodore[tm] Graphics and Sound Programming: Stan Krute
416pp HEA040 **$32.95**

Commodore 128[tm] Basic: Programming Techniques: Martin Hardee
192pp HEA043 **$25.95**

Troubleshooting and Repairing Your Commodore 64[tm]: Art Margolis
368pp HEA044 **$32.95**

IBM Assembly Language Simplified: Dr. Ruth Wessler
230pp HEA045 **$32.95**

Networking with the IBM Token Ring: Carl Towsend
220pp HEA046 **$32.95**

Master Handbook of Microcomputer Languages — 2nd Edition: Charles F. Taylor
512pp HEA047 **$32.95**

From Basic to Pascal: Ronald W. Anderson
324pp HEA048 **$22.95**

Turbo Pascal Programming with Applications: Dr. Leon Wortman
240pp HEA049 **$34.95**

CD-ROMs: Breakthrough in Information Storage: Frederick Holtz
224pp HEA050 **$30.95**

The Micro to Mainframe Connection: Penn Brumm
224pp HEA051 **$32.95**

Forecasting On Your Microcomputer — 2nd Edition: Daniel B. Nickell
400pp HEA052 **$39.95**

The Illustrated Dictionary of Microcomputers: Michael F. Hordeski
256pp HEA053 **$29.95**

To order simply fill in the coupon, remembering to include the code numbers and $5.00 per book postage and handling. If the coupon is missing write down the names, code numbers and prices of the books you require. Include your name, address, telephone number, plus cheque, money order or credit card details (card type, card number, expiry date and signature) and send it all to: Federal Publishing, Freepost No. 4, P.O. Box 227, Waterloo NSW 2017. No stamp is required. And don't forget to sign all orders.

COUNTING OUT RANDOM NUMBERS

WHAT IS A random number? Tattslotto provides a good illustration. Forty-five balls, each with a different number, are equally likely to be picked by the mechanism. The key is 'equally likely' – if there were three balls with the number eleven, that ball would be three times more likely to be picked than any other. The likelihood of being picked forms the 'distribution'. There are many distributions to describe random numbers, depending on the nature of the numbers.

Virtually all personal computers generate random numbers with a distribution rather like Tattslotto. We'll come back to that shortly – but first, study Figure 1.

The random numbers generated by computers are rectangularly distributed, usually between 0 and 1 (actually, the upper limit is usually just below 1, which is important in the applications to be explained). Hence the numbering of Figure 1 – the number 0.99999999 is shown as the upper limit of the distribution, but the actual number depends on the number of digits which the computer handles.

There are many uses for random numbers generated by PCs. As Mike Allison shows, they can be used to program games, investigate industrial problems and create fascinating graphics displays.

The numbers generated by the computer are termed pseudo-random numbers, because the sequence may repeat itself eventually. Remember, the computer is not carrying out the physical process of picking from among millions of balls in a barrel, but a mathematical algorithm is used to generate the numbers. However, for most practical purposes, the numbers may be treated as random.

Before launching into the tricks of generating random numbers, a few words of caution are in order. Computers all have random number generators, but differ in the ways in which these numbers are generated. Some machines always produce the same sequence of numbers. It is usually possible to change this by altering the 'seed' of the random number algorithm. Others may use the keyboard strobe or the internal clock as the seed, such that the starting condition is unpredictable. Consult your computer manual to be sure of your machine's methods.

A very common industrial use for random numbers is selecting samples when using quality control acceptance inspection procedures. The objective is to choose samples such that each item in the batch has an equal chance of selection. Often, practical considerations frustrate the use of random numbers in quality control – not all items are equally ac-

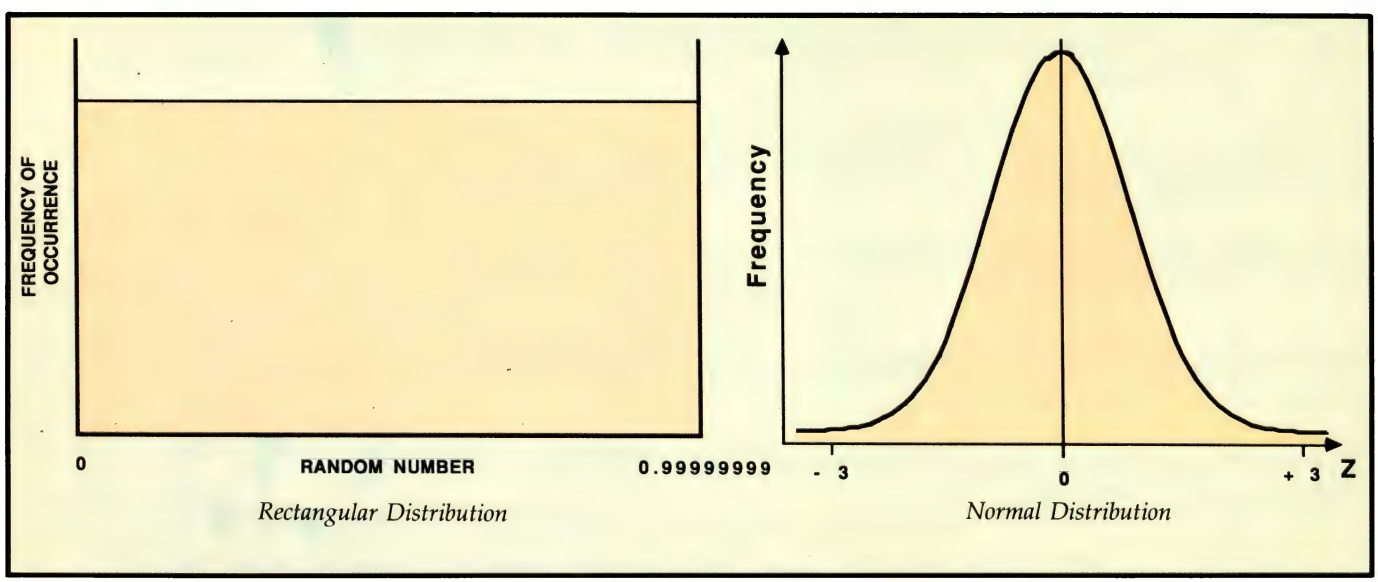


Figure 1. *In a Rectangular Distribution, all the numbers are equally likely to be picked – a random number can be any number in the range and each has an equal likelihood of being picked. In nature and industry, many distributions follow other distributions – the most common being the Normal Distribution; it's fully described by two parameters – the mean and the standard deviation, signified by the Greek symbols* μ (mu) *and* σ (sigma), *respectively. Normal Distribution applies to properties such as the height of people, variation of parts in some industrial processes and human intelligence. Obviously, the likelihood of picking a number from the normal distribution is not the same for all number values.*

cessible. However, this is still about the only way to avoid bias in sampling.

Apart from the games and statistical sampling applications, random numbers have widespread application in simulation, where generation of many random numbers can show what is expected to happen in some proposed mathematical procedure or complex practical situation. Random numbers may also be used to verify theoretical work or to show what will happen in cases where the theory is simply too difficult.

Examples of applications

RANDOM NUMBERS may be used to simulate drawing samples from a group of numbers (called a population by statisticians) in which the members either have a particular attribute or do not. Examples are in sampling for defective manufactured parts or gambling on picking a white ball or a black ball from a mixed bag. Suppose you wanted to simulate drawing from a bag of white and black balls, in which 0.5 per cent were white.

```
100 A$="L4U2D6U4R8U2D6BL4BU3D8"
110 SCREEN 1:CLS
120 X=160:Y=105
130 RANDOMIZE TIMER
140 FOR I=1 TO 10
150 GOSUB 180
160 NEXT
170 END
180 PSET (X,Y):DRAW A$:FOR J=1 TO 500:NEXT
190 VIEW (X-8,Y-4)-(X+8,Y+9):CLS
200 VIEW
210 ADD=INT(40*RND(1!))+10:WAY=SGN
    (2*RND(1!)-1!)
220 ADD=ADD*WAY
230 X=X+ADD
240 IF X>310 THEN X=310
250 IF X<10 THEN X=10
260 RETURN
```

Listing 1. *A Basic program to make a graphics 'spaceship' take evasive action using random numbers – there are two requirements to make the 'spaceship' dart from side-to-side, evading your shots. The variable ADD determines by how many pixels the spaceship will move: here it is a minimum of 10 and a maximum of 49. The variable WAY decides whether the variable ADD will be positive or negative. By subtracting 1 from twice the value of the random number, the result will vary between a maximum of 1.99999999 and a minimum of -1. Exceedingly rarely, the value may be 0. The SGN function converts the result to +1, 0 or -1. Again, is a most unlikely result.*

```
PROGRAM POLAR;
VAR I,J,N:INTEGER;
V1,V2,S,X1,X2,SIGMA,MEAN:REAL;
BEGIN
    CLRSCR;
    GOTOXY(1,4);WRITELN('Enter Process Mean ');READ(MEAN);
    GOTOXY(1,6);WRITELN('Enter No. of Samples ');READ(N);
    GOTOXY(1,8);WRITELN('Enter Standard Deviation ');READ(SIGMA);
    GOTOXY(1,10);WRITELN('Generating  ',2*N,' Random Normal Samples...');
    J:=1;
    WHILE J<N+1 DO
    BEGIN
        S:=2;
        WHILE S>=1 DO
        BEGIN
            V1:=2*RANDOM-1;V2:=2*RANDOM-1;
            S:=V1*V1+V2*V2;
        END;
        S:=SQRT(-2*LN(S)/S);
        X1:=V1*S*SIGMA+MEAN;X2:=V2*S*SIGMA+MEAN;
        WRITELN('X1= ',X1:7:2,'            X2= ',X2:7:2);
        J:=J+1;
    END;
END.
```

Listing 2. *A Pascal program to generate random normally distributed values using the 'polar method' above. Note the trick for creating a range -1 to +1 by doubling the random number in the range 0 to 1 and subtracting 1 (as for the spaceship example).*

In such a case, if 0 represented a white ball and 1 represented a black ball, then an appropriate distribution would be one that consisted 99.5 per cent of 1s and 0.5 per cent of 0s, where a 1 represents a black ball and a 0 represents a white ball. To achieve this distribution, it is simply a matter of partitioning the rectangular distribution and converting to 0s and 1s. For a distribution between 0 and 1, make any number below 0.995 take the value 1 and the rest 0 (the same could be accomplished by making anything below 0.005 equal to 0 and the rest equal to 1).

A suggested method in Basic is:

```
100 X=RND(1):X=ABS(X)>=.005)*1
```

This makes use of the logical capabilities of the computer to switch between the two values 0 and 1. In other words, if RND(1) was generated at 0.45, the test (X>=.005) would be true – the product 1 *x* 1 is 1; if RND(X) was 0.002, the test would be false and the product would be 0 *x* 1 = 0, giving the desired distribution.

Sometimes, the going gets tough when trying to work out theoretically, what is happening in a process. Even when one feels confident about a theoretical outcome, it is good practice to verify the theory with a simulation. In a recent telecommunications study, engineers monitoring switching equipment were using sampling tables to determine how many test calls should be made to provide 95 per cent confidence that each device in the switching equipment had been seized at least once. The equipment worked in such a way that calls were randomly allocated to devices in the switch.

It was desired to have the same confi-

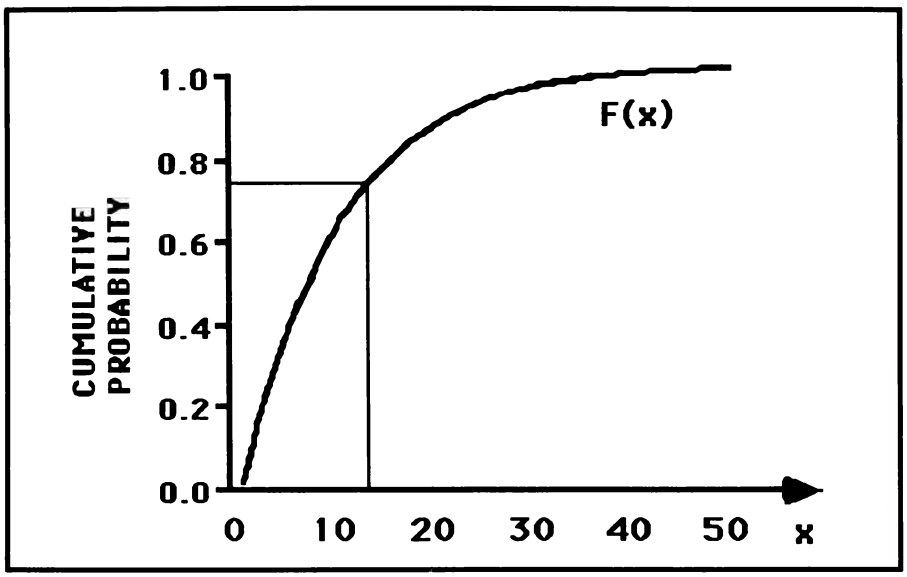


Figure 2. A modified negative exponential distribution, which can be used to describe the cumulative proportion of failures in a population of electronic components, with respect to time, for example.

dence that each device had been seized at least twice – what would the new sampling tables look like? After some pencil and paper work, a somewhat complicated formula was developed. To verify the formula, computer simulations were set-up to replicate the sampling process hundreds of times. This was quite a simple matter, and the simulation verified that the theoretical work was correct.

This theoretical work is typical of the case where the rectangular distribution out of the computer has to be converted into an integer range. This is easily done by simple scaling. Suppose there are 20 devices. Drawing from a population between 0 and 1, multiply the random number by 20, add 1 and take the integer value. In Basic, the procedure would be:

```
100 X=INT(20*RND(1.0)+1)
```

Note the importance of adding the 1. This is because the upper limit of the distribution is not quite 1 (it is 0.99999999 or something very close to 1). If the 1 is not added, the INTEGER function will return a maximum value of 19. Similarly, the lower limit would be 0. The technique above could also be applicable to an industrial engineering situation where a process consists of several servers, with random selection of the server, such as machinists collecting tools from a tool crib. The technique just used can be modified slightly to make a Tattslotto generator:

```
100 X=INT(45*RND(1.0)+1)
```

Sometimes it is desired to produce numbers between 0 and some upper limit. In the example above, the code would be altered to:

```
100 X=INT(21*RND(1))
```

Rectangularly distributed numbers may also be shifted, as well as scaled. Suppose you required random integers between 80 and 120. This is achieved by the following code:

```
100 X=INT(41*RND(1)+80)
```

Suppose you wanted to develop a card game for the computer. Choosing an integer between 1 and 53 is a simple matter. If each number is assigned to items in an array of strings (in other words A$[1] = 'Ace of Spades'), you will have the means to generate a hand of six cards. It will of course be necessary to check that an integer in the array is only assigned once per run. The number 53 could be the Joker.

Armed with the ability to generate random integers between any two values, the coordinates for graphics plotting can now be set-up on a random basis. Try your hand at substituting random integers in the graphics routine in Listing 1.

Rectangularly distributed numbers are useful, but many processes in nature relate to normally distributed quantities – this is no problem. Rectangularly distributed random numbers in the range 0 to 1 can easily be converted to random normal deviates (z-scores), which in turn may be scaled to suit any normal distribution, using the fundamental relationship:

$$z = \frac{x-\mu}{\sigma}$$

where:
z is the deviate or 'z-score'
μ is the mean of the normal distribution
σ is the standard deviation of the normal distribution
(uf1970) the standard deviation squared is equal to the variance of the distribution

To make the change from rectangular to normal, use is made of the convenient properties of a group of 12 random numbers. The sum of n numbers rectangularly distributed in the range 0,1 has a mean of $n/2$ and a variance $n/12$. Hence, by taking the sum of 12 random numbers from a rectangular distribution and subtracting 6, a good approximation is obtained to a single variate drawn from a normal distribution with zero mean and a variance of 1. However, this relationship is approximate and while it may be suitable for most tests, a mathematically rigorous generator has been developed by Box, Muller and Marsaglia:

```
step 1: obtain a pair of random numbers V
        and V, independently
        and uniformly distributed between
        -1 and +1.

step 2: evaluate S = (V ) + (V ) until S(1

step 3: evaluate S = -2 ln(S)/S

step 4: set X = V S and X = V S
```

For most practical work, mathematical

Low Cost Software for your PC

Low cost software is now available for your IBM & compatible PC or your Commodore 64/128. Quality user supported and public domain software is available for $12 a disk. No membership charges, no postage charges, no requirement to purchase more, just quality software at very low prices. Below we list just some of our great programs for the IBM PC. Call or write for your complete 16 page catalogue free of charge. No obligations, just the opportunity to save money .

BUSINESS

PC1009 PC DESK: Good program that allows you to keep a file of names and addresses and easily merge them into your documents using the inbuilt word processor. Also provides handy access to a calendar, calculator and phone dialler.

PC1022 TURBO SPELL: Spelling checking program that includes its own large dictionary and allows you to add your own words easily.

PC1037 READRITE: Memory resident style analyser that allows you to determine the readability using the Flesch scale, of text on your screen as you type it.

PC1080 THOUGHT ORGANISER: Thor, a brain scanning program. Allows you to outline your thoughts and ideas on any topic and review them, edit them, scan them, and print them as you need. Great for students and business people.

PC1220 ONBASE DATABASE: Excellent memory resident "pop-up" database which allows you to have up to three databases resident on your computer at all times.

PC1240 FILEMASTER: Program designed to help you manage your paper files. Allows you to maintain them in serial order and look them up by subject, category, sender, receiver, or a number of other criteria.

PC1400 LOTUS COMPATIBLE SPREADSHEET: AsEasy, an excellent Lotus 123 compatible spreadsheet program with almost all the features of its famous counterpart, and a host of power features.

PC1410 INSTACALC: Powerful memory resident "pop-up" spreadsheet which can read Lotus files. Can import data direct from screen and export data directly into word processing documents.

PC1623 PC BILL MASTER: Cheque book management program which is very easy to use. Has a regular cheque book register type display and maintains recurring payments. Allows for easy bank statement balancing, and up to 100 ledger accounts.

PC1681 SOLVE-IT: Financial analysis program which calculates return on investment, break even analysis, depreciation schedules, loan schedules and even statistics. Computes 28 functions in all.

PC1750 SPC INVENTORY: Good inventory program which keeps track of sales, stock, and replacement cost. Can add sales tax, and handles up to three selling prices per item.

PC1860 MANAGEMENT TUTOR: Collection of programs that provide a complete computerised management course. Covers communication, delegation, decision making, interviewing, and planning.

PC1962 EASY PROJECT: Project management tool which allows upto 20 user defined project phases, unlimited number of resources per project, up to 1000 user defined tasks per project, fast data entry, automatic scheduling, and Gantt chart production.

PC3101 OVERVIEW: DOS shell file manager for hard disk users. Enables you to carry out routine file commands easily as well as providing a tree directory of your drive, multiple window access to up to six directories, file view function, and more.

PC3230 CP/M TRANSFER: Excellent CP/M to DOS transfer utility that also includes a CP/M emulator. Allows you to read Osborne, Kaypro, Morrow, and other CP/M formats, and even run the CP/M programs on your PC. **TWO DISK SET.**

PC3270 SOFT-TOUCH: Keyboard utility that allows you to program individual key combinations with user defined keystrokes or macros. Also allows you to combine three keystrokes into even larger macros.

PC3400 LQ: Memory resident printer utility that allows you to produce letter quality print on inexpensive dot matrix printers. Also lets you use different font sets on your printer with four fonts available at all times. Suitable for Epson, Star, Citoh, and IBM Proprinter.

PC3450 CLASER: Excellent utility for HP Laserjet users. Allows easy choice of printer fonts, printer port, graphic screen dumps, and even allows Laserjet to emulate an Epson FX printer.

PC3500 P-BASIC: BASICA compatible basic interpreter. Runs almost all Basic software. Suitable for Amstra PCs to replace non compatible BASIC-2.

PC5030 OPTIKS: Astounding graphics package which allows you to read and write almost any graphics format including MacPaint, PCPaintbrush, Newsroom, MS Paint, and more. Supports most printers including HP Lasejet, and even supports scanners. Most powerful graphics package we have seen. **TWO DISK SET.**

PC5750 BARCODE GENERATOR: Create barcodes with this program and your printer. Uses 3 of 9 system which allows for full alphanumeric coding. Configured for Epson and IBM Proprinter, but can be configured for other printers.

RECREATION

PC2030 3D CHESS: Excellent graphics chess game suitable for both CGA and Hercules video. Multiple levels of play from beginner to champion. Allows analysis of play, help as you play, and a true three dimensional view of the screen.

PC2042 DIAMOND BASEBALL: Text simulation of the play by play action of a baseball game. You are presented with all the situations faced by a major league manager. So good it was used by a US radio station to simulate a game cancelled due to a strike.

PC2060 AMERICAS CUP YACHT RACE: Excellent graphics game which allows you to race the cup from your PC. Control the rudder and the sails as you tack and round the buoys with the best. This game has to be seen to be believed.

PC2052 REFLEX POINT: Graphics game where you have to save the Earth from Invids. In order to complete your mission you will use motor cycles that become body armour and jets that become robots.

PC2054 NINJA: Martial arts game which combines platforms with arcade action fighting. Requires CGA video card.

PC2100 SLEUTH: Adventure game where you have to find the murderer. Each time you play a new scenario is produced so you never get bored.

PC2106 SPACE QUEST: Adventure game with graphics where you are travelling through space and as you near your destination, trouble strikes.

PC2110 BRAINSCAPE: Excellent educational adventure game which teaches you neuroanatomy as you play. You find yourself alone in the brain fighting to find your way out. Interesting graphics.

PC2202 BLACK JACK TUTOR: Blackjack game which actually helps you improve your game. You play against the computer which helps you practice new tactics and strategy as you play.

PC2300 WAR ON THE SEA: High level strategic and tactical simulation of typical World War II naval campaigns.

PC2353 MEGAGOPOLY: Great investment strategy game . You inherit $100,000 and must obtain financial independence. Test your investment skills whilst having fun.

PC2800 ASTROTIT: Adult arcade game. Destroy the falling objects before they destroy you. However you have to see them to believe them. Great fun for adults.

PC2806 FRENCH: Adult adventure game based in a French whorehouse. Find your way out but make sure you "look" at all the girls first.

PC8005 ABC : Good program for children to learn letters and numbers, and also develop their computer literacy.

PC8020 CALCULUS TUTOR: Good program for those ready to learn Calculus and advanced mathematics. Covers trigonometry, algebra, exponents and more.

PRICES

5 1/4".....$12 a disk

3 1/2".....$18 a disk

FREE POSTAGE & HANDLING

HOW TO ORDER

To order any of our software just write down the names and numbers of the programs you require along with your name, address and computer type, and mail it with payment by cheque, money order, or creditcard to

FREEWARE
P.O. Box 496
Newtown NSW 2042

or call us and use your creditcard on

(02) 519-4233

Fax (02) 516-4236

Credit cards accepted are Bankcard, Visacard, and Mastercard. Please include your card number, type and expiry date.

Commodore 64 Software also available

precision is not too important, but it is as well to understand that rough methods belong with rough estimates. Basic is starting to get a little slow, particularly if a large number of replications are required. Listing 2 shows a Pascal program to generate random normally distributed values using the 'polar method' above.

What if you are dealing with a process that is not normally distributed? Many industrial engineering and telecommunications problems may be modeled by the Poisson process, which involves discrete (whole) numbers. Rectangularly distributed random numbers can be transformed into Poisson random numbers:

```
step 1: set B = exp(-M), where M = mean of
        Poisson process
        (chosen by the user)

step 2: multiply successive random numbers
        together until the product
        is less than B

step 3: subtract 1 from the count of
        random numbers used in

step 2. This value is the Poisson random
        variable
```

```
PROGRAM POISSON;
TYPE
KOUNTER=ARRAY[0..20] OF INTEGER;
VAR I,J,MEAN,N:INTEGER;
SUM,BOGEY:REAL;
SCORE:KOUNTER;
BEGIN
    CLRSCR;
    FOR I:=0 TO 20 DO
    BEGIN
        SCORE[I]:=0;
    END;
    GOTOXY(1,4);WRITELN('Enter Poisson Mean ');READ(MEAN);
    GOTOXY(1,6);WRITELN('Enter No. of Samples ');READ(N);
    BOGEY:=EXP(-MEAN);RANDOMIZE;J:=1;
    WHILE J<N+1 DO
    BEGIN
        SUM:=RANDOM;I:=0;
        WHILE SUM>=BOGEY DO
        BEGIN
            SUM:=SUM*RANDOM;I:=I+1;
        END;
        SCORE[I]:=SCORE[I]+1;
        J:=J+1;
    END;
    CLRSCR;
    GOTOXY(20,1);WRITELN('** Random Poisson Values for Mu = ',mean,' **');
    GOTOXY(3,3);WRITELN('Observation  Frequency');
    FOR I:=1 TO 20 DO
    BEGIN
        WRITELN('       ',I:3,'          ',SCORE[I]);
    END;
END.
```

Listing 3. *A Pascal program to generate Poisson distributed random variables. If your requirement is for a negative exponential distribution, which has wide industrial applications, random numbers from this distribution may be generated by the simple process of taking the natural logarithm of the random number from a computer and changing the sign. The resulting distribution has a mean of 1 and can be scaled by direct multiplication.*

Listing 3 shows a Pascal program to generate Poisson distributed random variables.

Any distribution which may be expressed as accumulating on a scale 0 to 1, may be created by transformation of rectangularly distributed random numbers, provided the cumulative distribution function is known and can be transposed to give values of the variable under consideration in terms of the cumulative probability. Figure 3 shows how this is possible. Since the cumulative probability is in the range 0,1 it is simply a matter of finding the corresponding value on the x-axis. An example of a cumulative function is shown below:

$$F(x) = 1 \text{ (uf1970) } e^{-x/10}$$

This is a modified negative exponential distribution, which may be used to describe the cumulative proportion of failures in a population of electronic components, with respect to time – see Figure 2. By taking random numbers to locate a position for F(x), the corresponding value of x may be found by arithmetic:

$$x = 10 \log_e \frac{1}{1 - F(x)}$$

In all cases where transformations or even the raw random numbers are being used in simulation, a goodness-of-fit test should be conducted to verify that the desired distribution is in fact being obtained. Although professional statisticians may be a bit horrified by the simplifications made in this article, most practical situations do not demand a degree of precision better than the somewhat rough output of a PC. It is worth noting that even different machines in the same series may use different methods of generating random numbers. If your application is critical, consult a statistician. □

What is Shareware ...and why does it cost so much less?

FREE Software Bonus

to every new member of the PC.SIG Library

MAHJONG — the fascinating Chinese Game.

PC LEARN — an educational tool for students of all ages.

HOT CODE — an incredible memory resident post code and postage rate calculator.

How it works

Shareware relies upon the honesty of software users to pay for the software that they use.

Shareware bypasses the costs associated with conventional marketing and promotion of software by inviting users of software to give copies of the software to their friends.

If the user of the software likes the product and wants to continue to use it in any way then the user should register that software.

When a user registers the software the author gets a return for his effort in creating the software and is encouraged to improve the product and to develop new products.

Rather than implementing cumbersome copy protection schemes shareware authors do exactly the opposite — they actually encourage their users to make copies of the software for their friends.

Word would spread slowly if the author solely relied upon users just sharing copies with their friends. User groups are encouraged to share the software with their members on a non profit basis.

Many user groups set up Bulletin Boards so that members can "down load" software which they would like to evaluate for use. This is another accepted way of distributing shareware.

Some commercial operations also distribute shareware and charge for the disks. Again this is an accepted way of distributing shareware providing the disk distributor meets certain criteria set down by the authors.

What is the difference between Shareware and Public Domain Software?

Public Domain software is created by authors who chose not to seek formal rights or royalties. There is no restriction of any kind on distribution of this kind of software. Most public domain software is games or utilities. There are very few complete products in the public domain.

Shareware software on the other hand is distributed so the user can evaluate the software to decide whether he will register with the author and continue to use the software.

Shareware is an alternate method of marketing software, not really a different kind of software. In fact the more successful Shareware products hold their own against their commercially distributed competitors. The greatest difference is that the Shareware product's packaging is not as fancy and the price is much lower.

Where can I obtain Shareware trial disks?

A collection of Shareware disks is usually referred to as a Library. A Library may be kept by a user group, a bulletin board operator or by a commercial diskette distributor.

A lot has been said and written about viruses. There is no doubt that a virus could be distributed hidden in a public domain or shareware disk.

Care needs to be taken that the library you use for disks takes every reasonable step to eliminate the possibility of a virus. Careful checking is not sufficient as it is simply impossible to check every single disk to the degree which would be required.

The safest way for your library to obtain Shareware disks is to source them directly from the authors. This of course means that the source of every disk is known and the insidious perpetrator of a virus cannot hide behind a cloak of anonymity.

The Shareware authors are always releasing new versions of their software and you should ensure that the library is kept up to date with the latest available versions.

Before you purchase any disks you should ask if the software and the latest versions are sourced directly from the authors. If the answer is "yes" you can be reasonably sure that you are getting the latest versions and that they should be quite safe to use.

Do I need to join a Library?

Some commercial libraries and most user groups insist that you join before you can purchase disks. If you intend to purchase disks a properly prepared catalogue will make your selections easier and repay your membership costs many times over.

Other libraries allow purchases without any membership fees and some offer a free catalogue. The free catalogue is usually a very short desciption of available disks and is often given away as an insert in magazines. Often you'll end up buying more disks than you really need because the descriptions are so short you really are taking a lucky dip!

What is PC SIG?

PC SIG is the world's largest Shareware library and contains around 1400 disks. PC SIG not only produce a comprehensive 660 page directory to their library but publish a bi-monthly magazine.

This magazine, appropriately named "Shareware" lists new additions, upgrades to existing disks and compares products from different authors.

Members of the PC SIG Library receive the two volumes of the directory and a subscription to Shareware magazine. Not only do members have access to the most comprehensive directory but they are kept right up to date with the hundreds of upgades made each year.

To ensure that the library contains the best quality products no disk is added to the PC SIG Library unless it is obtained directly from the author. There can be no anonymous interference with PC SIG disks!

PC SIG also offer a money back guarantee and support to get any disk started.

You do not need to be a member of the Library to purchase PC SIG disks. Five disks are just $50 and then additional disks are only $5 each.

Libraries often represent that they offer PC SIG disks BUT unless the disks are grey and carry PC SIG's logo they are not genuine PC SIG disks. PC SIG cannot take any responsibility or offer support nor the money back guarantee on such disks. Invariably such libraries do not bother updating to the latest version at all, or at best they will update from time to time so they can claim that they do update.

Are registered Shareware copies available in Australia?

PC SIG's distributor in Australia, Manaccom, offers the full PC SIG library and also has arrangements with many Shareware authors to represent them in Australia.

If you return the PC SIG Shareware disk when investing in a registered copy you will be refunded $5 per disk. This means that the trial could be at no cost if you decide to continue to use the product.

We know that the PC SIG Library is the best Shareware value available, and we would like to prove it to you.

Membership of the PC SIG Library in Australia is just $38 (plus $5 post and handling). Mail the coupon or call our 008 number for the cost of a local call, quote your credit card number, your name and address, and we will enrol you as a member of the PC SIG Library. Plus we'll include our free software bonus. If you are not 100% satisfied return the Directory to us within 30 days and we will refund your $38 — no questions asked. And you can keep the software bonus even if you decide to return the Directory.

Use the Coupon or call our toll free hotline

008 77 7601

MANACCOM Pty Ltd

Freepost 29
P.O. Box 509 Kenmore QLD 4069
Call 07 368 2366 Fax 07 369 7589
Orders 008 77 7601

Personal collection from our Milton office can be arranged. Please call first so we can have your order prepared.

☐ Yes, I would like to join the PC.SIG Library. I look forward to receiving my 660 page Directory and free software bonus. If I am not entirely happy I can return the Directory in 30 days for a full refund of my membership fee of $38. I understand that the $5 post and handling cost is not refundable.

☐ No, I don't wish to join right now but I would like further information.

MR, MRS, MISS _____

Address _____

_____

State _____ Code _____

Payment by ☐Cheque/M.O. ☐C.O.D. ☐Visa ☐M'Card ☐B'Card Expiry _____

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Signature _____

Make your business more productive. Attend meetings while you're asleep.

Have you ever wished you could be in two places at once?

It's not such a fanciful thought.

With Wang Freestyle you can, to all intents and purposes, hold a meeting with someone else, while you're doing something completely different.

Like being tucked up in bed, asleep in Australia, while explaining some important figures to a colleague in, say, New York.

How is this possible?

The answer is with an electronic notepad, an electronic pen and a phone.

They are the components of Freestyle and they can turn any AT or AT compatible PC into a business tool with astonishing capabilities.

Not least of which, is the ability it gives you to send both written and spoken messages to other

SSBISVC WANG-PK

parts of your network.

For example, imagine you've been working on some figures (sent from the New York office) on your PC.

Some of the numbers don't look right and you'd like to personally run through them with your colleague.

You could get on a plane.

More likely, you'd get on the phone.

Only problem is, you'd have to stay up half the night and even then you couldn't actually show him what you're talking about.

But with Wang Freestyle you could 'capture' a copy of the spreadsheet on your PC's screen.

And then write notes, circle figures and draw conclusions directly onto the spreadsheet itself.

Simply by writing or drawing on the notepad with the pen.

You can even record whatever spoken message you wish to accompany your notes, using Freestyle's phone.

The next part is truly astounding.

By merely pointing to a few icons (pictures representing a phone, an out-tray, a telephone directory and the like) you can send the whole box and dice through your network to the office in New York.

The spreadsheet, with your written notes and your spoken message, will be transmitted across the Pacific into your colleague's PC.

For him to work on, when he wakes up.

Freestyle also allows you to print hard copies, scan documents and images, write on blank pieces of paper and staple one thing to another.

And throw what you no longer require into a waste-paper basket.

All on the same PC you use for running other programmes.

If it can be done better Wang will find a way.

For more information, fill in the coupon. Before you lose any more beauty sleep.

Or phone Sydney (02) 925 5692 and in other areas on (008) 226 963 between 9 am and 5 pm E.S.T.

For Freestyle information post to Wang Direct, P30, 168 Walker Street, North Sydney, NSW 2060.

Name _____

Address _____

_____ P/code _____

Title _____ Tel _____

Type of Business _____

WANG
AUSTRALIA

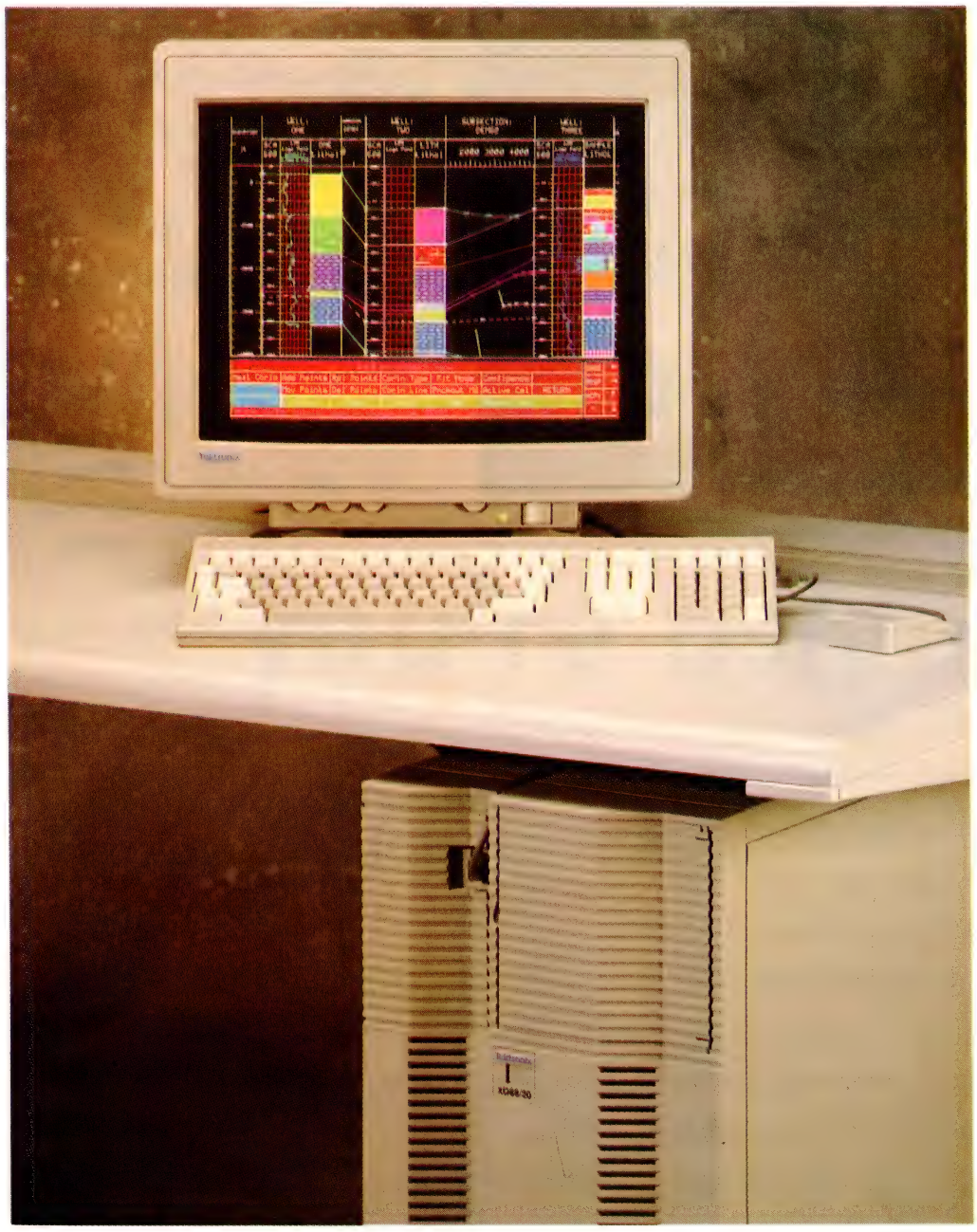
SSBISI YC WANDYR

NEW PRODUCTS

Digital Video Interface

Tektronix
Phone: (02) 888 7066
Price: under $12,000

Tektronix Digital Interface board produces output for direct feed to recorders or studio production equipment in a range of formats including NTSC/PAL, SuperVHS and SMPTE component digital. The interface captures full-screen graphics in real time at 30 frames per second. Aimed at engineering and entertainment applications, the board has PAL encoding and Genlock and includes custom gate arrays to convert the 1280 by 1024 workstation image to video resolution. As well as the real-time video capture facility, the interface provides a ten-bit-deep video frame buffer that can be used for rendering broadcast quality animations. It supports Tektronix' 4300 series graphics workstations and their new RISC-based XD88 'super-workstations'



Mouse Systems Mouses

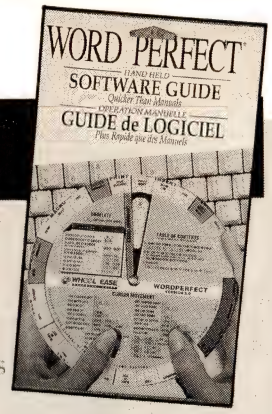
Sourceware
Phone: (02) 427 7999
Price: See below

Sourceware have been appointed the distributor of the Mouse System range of mouses. The two-button, optical PC Mouse II ($280) is supplied with high-resolution software that allows nine different speed settings for resolution from 20 to 6400cpi. It is fully Microsoft mouse compatible. A pop-up menu system supplied with the mouse includes 24 pre-designed menus for popular applications. The PC Mouse PS/2 and PC Mouse (both $210) are optical three-button mouses; these are also supplied with a pop-up menu system. The two-button, opto-mechanical Omnimouse ($148) is Microsoft compatible and includes the pop-up menu system supplied with 13 pre-designed menus. There are also two Apple mice in the range – the optical A+ Mouse ($188) plugs into the mouse port at the back of the computer and is designed to be used with the Lisa, the Mac 512K and Plus, and the Apple IIc/e; the A+ ADB Mouse ($228) is designed to plugs into the keyboard of the Mac II and SE, and the Apple IIGS; it features Apple's Desktop Bus Interface.

Erorr

THE GEM ARTLINE graphics illustrator offer on page 125 of our June issue showed an incorrect address and supplier – it should have read: Quercus Distributors, 4/159 Burbridge Rd, Hilton, South Australia.

Wheel Ease software guides



Wheel Ease software guides

Bloomfield Computing Services
Phone: (02) 819 6488
Price: $14.95 each

Bloomfield Computing are importing a range of handy software guides in the form of a circular plastic wheel, similar to a circular slide rule. Around the rim of the outer wheel are listed various program functions (Text, Delete Text, Block, Insert, File, Macro and so on, on the WordPerfect 5.0 version); users turn the inner wheel until the pointer is over appropriate command. A window in the center will then display the relevant keyboard commands. The Wheel Ease range of guides currently includes WordStar, WordPerfect, MS-DOS, Lotus 1-2-3, MS Word, Display Write, MultiMate and dBase with others under development.

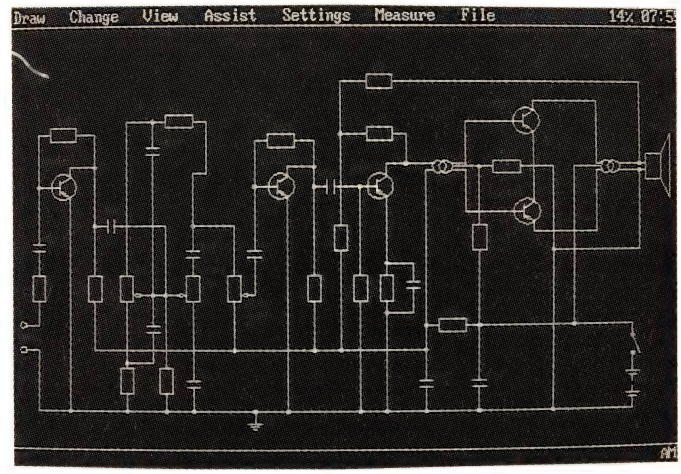
Jaeger 80386 portable

Chendai
Phone: (02) 663 6509
Price: not supplied

The Jaeger 340 portable has an 80386 processor, a VGA plasma screen, and an internal 40Mb hard drive (28ms access), the machine weighs 8kg. The standard configuration includes 2Mb RAM (expandable to 6Mb), a high-density 3½ inch drive, two serial ports and a parallel port, external VGA monitor port. The 340 is bundled with DOS 3.3 and a carry bag is standard.

Autosketch 2.0

Autodesk
Phone: (03) 429 9888
Price: $250



Enhancements added in version 2.0 of Autosketch include bi-directional compatibility with AutoCad, full architectural dimensioning, multiple text fonts, area fill and design features such as fillert, chamfer and ring and box array.

Remote control keyboard

Dimension Graphics
Phone: (02) 929 5855
Price: $449

The Forte Remote Control keyboard allows users to send commands to PCs and PS/2 and compatibles from up to 50 feet away. Using infrared signals, the ten-ounce device communicates with a receiver plugged into the computers serial port. Designed for remote presentation and teaching applications, a supplied software driver includes an onscreen pointer to call attention to particular items.

Opus 1

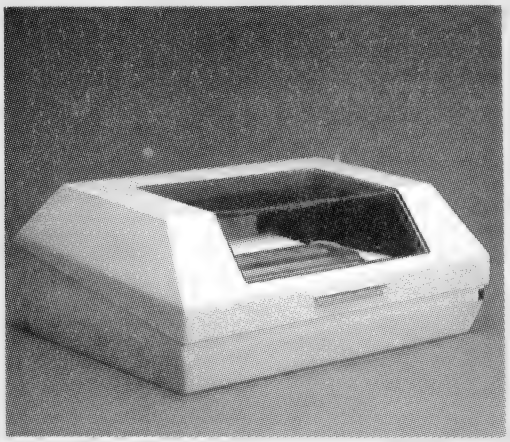
Software Suppliers
Phone: (02) 888 1955
Price: $625
(includes Windows/286)

Opus 1 combines drawing facilities with a database. Designed for use

Acoustic hoods

Acoustic hoods

Entron Engineering
Phone: (03) 748 3999
Price: from $400



A new range of Australian designed and built acoustic printer hoods are now available from Entron Engineering. Produced in a tough, moulded polymer, the SuperQuiet series is offered in sizes from 570mm wide *x* 460 deep *x* 190 high to 710 *x* 580 *x* 460. The hoods provide noise reduction up to 20 decibels and incorporate a paper feed return system to prevent paper catching and bunching.

as a visual tracking system, a computer-aided training tool, a presentation graphics production program or an application organiser, Opus 1 provides an array of object-orientated drawing tools, including a three-point bezier curve tool for drawing rounded corners. Each drawing file can hold 10,000 records with 100 fields; fields can store up to 1023 characters of text, dates, numbers or pictures. Number fields can be calculated on the basis of other number fields. A Table View facility allows several records to be on screen at once for comparison. System requirements are an AT or PS/2 (or compatibles), 512K RAM, DOS 3.0 or higher and a mouse.

Ricoh PostScript printers

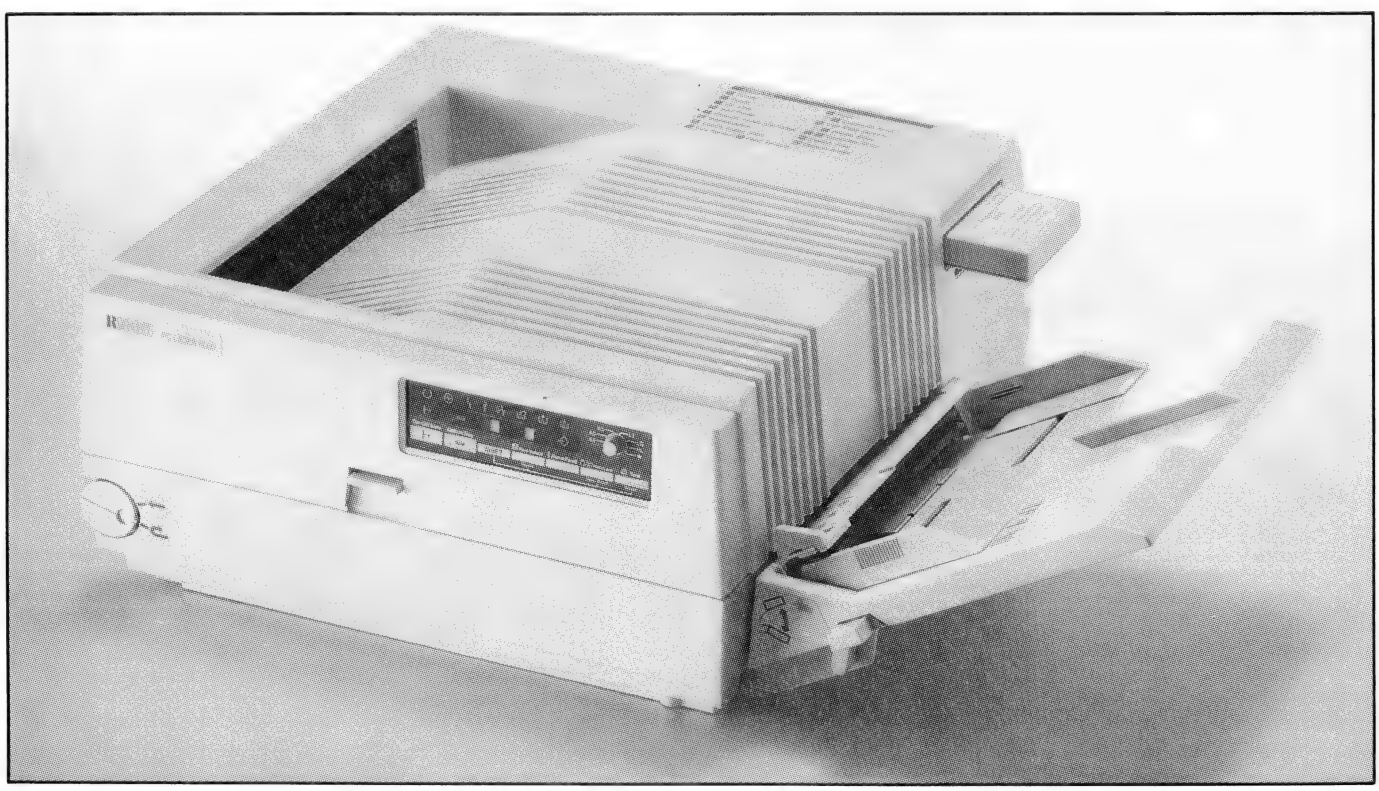
Mitsui Computer
Phone: (02) 452 0481
Price: $6695

Ricoh's new PC Laser 6000/PS is a six-page per minute laser printer supplied with 2Mb of RAM (upgradable to 4Mb), and parallel, serial and AppleTalk interfaces. Adobe PostScript (version 50.5) with 35 outline fonts and LaserJet II emulation with 12 HP fonts are standard. An optional auxiliary paper tray allows two different type of stationery to be used to print one document.

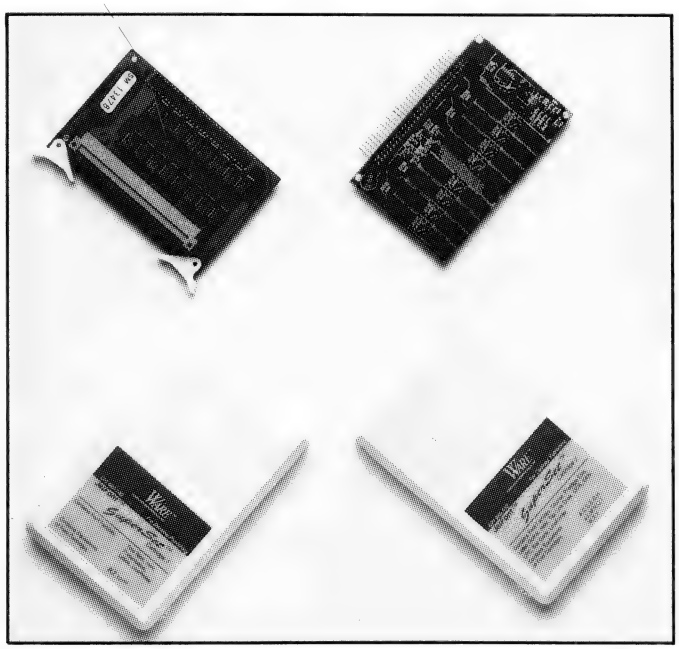
Laser printer expansion

Interface Technology
Phone: (02) 484 8400
Price: $999 1Mb; $2005 2Mb
Expansion modules: $1033 1Mb; $2005; $3856 3Mb
$786 JetFont SuperSet

The JetMemory plug-in modules can be used to boost HP LaserJet and Canon Laser Printers memory to 1.5, 2.5 or, for a networked printer, 4.5Mb – memory can be added one step a time. The two-cartridge



JetFont SuperSet provides 150 fonts, ranging from six to 18 point; both cartridges can be installed at the same time and switched between by software.



Macintosh hard drives

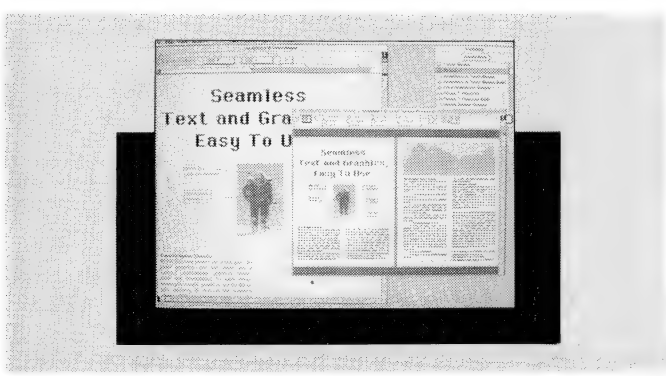
Zytech
Phone: (097) 21 9622
Price: See below

A range of SCSI hard drives for the Macintosh Plus, SE and II are now being imported by Western Australian-based Zytech. All drives are pre-formatted with system and utility software; 5Mb of software and all cables are included in the prices; the drives are available in both internal and external configurations: 21Mb $815 internal ($915 external); 32Mb $895 ($995); 47MB $995 ($1155); 65Mb $1095 ($1255); and 82Mb $1285 ($1385). A 44Mb removable drive is also available ($1795).

Nisus

Trio Technology
Phone: (03) 521 0099
Price: $530

Nisus, a text editor for the Macintosh, includes tools for text pattern matching, integrated graphics and programmable macros, and 32,000 levels of undo. Integrated graphic tools give the ability to draw directly onto a text page and then have the text wrap around the drawing. Using the GREP (Global Regular Expression Parser) facility – a text pattern matching system – users can search and replace any pattern of characters, regardless of font or style; wildcards and calculations are supported so that, for example, foreign currencies could be converted to Australian dollars across an entire directory; GREP can also be used for automatic indexing. Programmable macros allows users to design dialog boxes for automatic user input to documents and templates. Nisus can read Microsoft Word and MacWrite documents and is compatible with PageMaker 3.0; the Zap Gremlin feature deletes garbage characters from text imported from other word processors. Other features include a compare files function, parentheses checking, an interactive page preview mode, keyboard reassigment and multiple headers and footers. Nisus is Multifinder compatible and requires a Mac with 1Mb or more of memory.



Close-up/LAN

Micro Support Systems
Phone: (02) 439 7773
Price: $575 two-user license
$45 16-user 'test-drive'

Developed as an extension to the Close-up family of PC to PC communications products, Close-up/LAN is supplied as memory-resident Viewer and Host programs – these support multiple simultaneous connections. Other features of the menu-driven network include re-

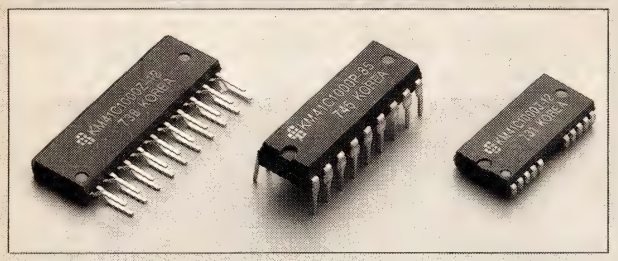
HP Vectra price cuts

HP Vectra price cuts

Hewlett-Packard
Phone: (03) 895 2895
Price: see below

Taking advantage of streamlined production techniques including surface mount technology, Hewlett-Packard have announced price reductions up to 25 per cent for their Vectra range of personal computers. As examples, the Vectra ES/12 series (12MHz 80286, 40Mb hard disk, VGA, 640K RAM) is now priced at $5195 (old price $5892); the Vectra QS/20 Model 15e (20MHz 80386, 40Mb hard disk, VGA, 1MB RAM), $6785 ($7865); and the top of the line Vectra RS/25c (25MHz 80386, 310Mb hard disk, memory caching, 4Mb RAM), $21,095 ($27,543).

Memory chips



Memory chips

Skandia Electronics
Phone: (02) 387 8166
Price: see below

Skandia Electronics are now stocking a wide range of dynamic RAMs (DRAMs) in dual in-line (DIL) packages and single in-line modules (SIMMs) for upgrading the memory boards of most PCs. The range includes: the 4164-12 (64K x 1, 120ns), $2.65 each; 41256-12 (256K x 1, 120ns), $7.90 each; 41464-12 (64K x 4, 120ns), $8.30 each; 41C1000-8/10 (1Mb x 1) 80ns, $24.90 each and 100ns, $23.95 each; 44C256-10 (256K x 4, 100ns), $24.90; and 591000-8 (1Mb x 9 SIMM, 80ns), $285 each. Skandia will mount the chips on pre-socketed memory boards free of charge in a static-free environment.

mote printing, dialog window for conferencing, three-level password security and a resource manager that can be configured to automatically back-up designated PCs. Close-up/LAN is compatible with LANtastic, Novell NetWare, IBM's PC-LAN, 3Com 3Plus and other NETBIOS compatible networks. It requires 25 to 50K of RAM for the Host program and 66 to 76K for the Viewer.

Lotus Magellan

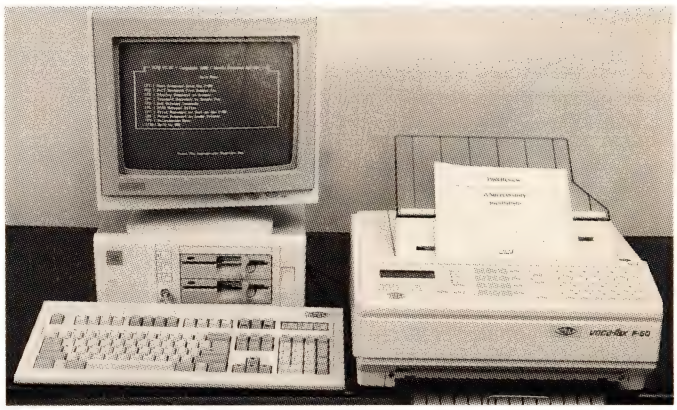
Imagineering
Phone: (02) 697 8666
Price: $199
($295 from Sept. 1)

Magellan is a hard disk management utility designed to find, view and manage data; it combines a DOS shell, file management utility and text retrieval software. The Search feature can search a maximum of 32,000 files for name, words, phrases or concepts. By means of an efficient indexing system which only uses five to seven per cent of the total files' original size, a single word can be located on a 40Mb hard disk in three seconds. The View feature displays all Lotus-application files, ASCII files, documents from most popular word processors and dBase III files. The Launch function automatically opens a file once it is found and launches the native application. Magellan can search and view files on any logical PC drive. It requires a 512K machine and DOS 2.1 or later.

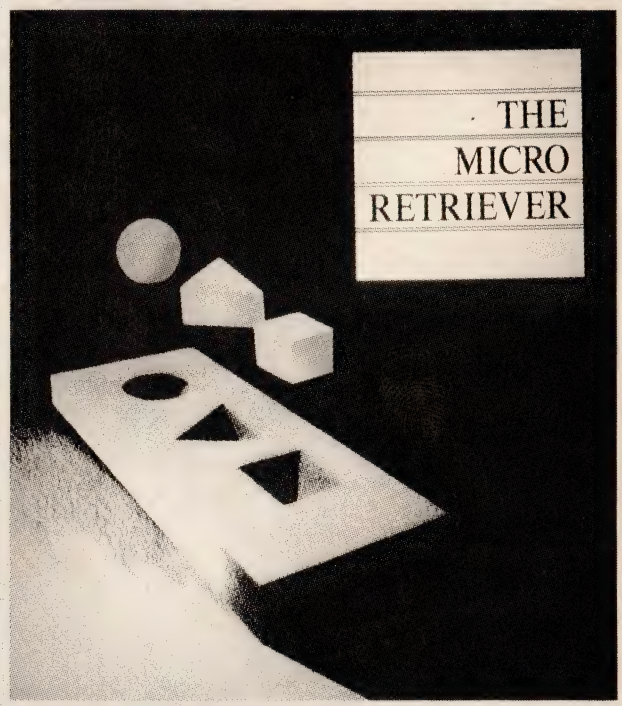
Facsimile Interface

Sagem Australasia
Phone: (02) 516 5399
Price: from $5798
$1500 software

Telex supplier Sagem have released the F-50 FIP (Facsimile Interface Processor) which can be used to turn fax machines into remote printers or scanners – it can be used in conjunction with IBM compatibles or mainframes and minicomputers operating in an asynchronous ASCII environment. The interface is G2 and G3 compatible and polling from G3 units is possible. The FIP software features a Notepad for creating documents and it is possible to merge text, graphics, signatures and logos with documents; Dr Halo can be used to insert or edit graphic images. Other features include data compression for stored documents, 999-number phone directory with find and sort facilities, image rotation and call grouping for broadcasts and polls.



The Micro Retriever



The Micro Retriever

Sourceware
Phone: (02) 427 7999
Price: $599

Developed as a subset of The Corporate Retriever by Brisbane-based OCOM, The Micro Retriever enables users to retrieve information from documents using words, numbers or phrases as keys. The system is based on three simple commands: Find (which responds with 'There are *x* references in *y* documents'; List displays the titles of the documents; and Browse displays the documents in a nominated order. The package includes interfaces to most popular word processors.

Accounting software that'll make stars of the most chicken-hearted computer users.

Computerizing business accounting can ruffle the smoothest feathers. But now there's Bedford Accounting Software for the PC. ***"If we had to pick just one accounting system... this would be it. Quick, easy... limits confusion for neophytes"*** *commented Infoworld*.* *When PC Magazine* made it* ***"Editors Choice"*** *they said:* ***"So well integrated it's a snap — even for non-accountants."*** *New, Australian Bedford includes general ledger, receivables, payables, payroll, inventory, and job cost modules: enter data in one, the others automatically adjust. 30 days free telephone support is provided along with a free update if tax changes have occurred. Continued support costs $99 a year, directly from us — chicken feed compared to what you'll save with accountants and consultants. Call us at (02) 371-6931 for information. Dealer and distributor inquiries welcome.*

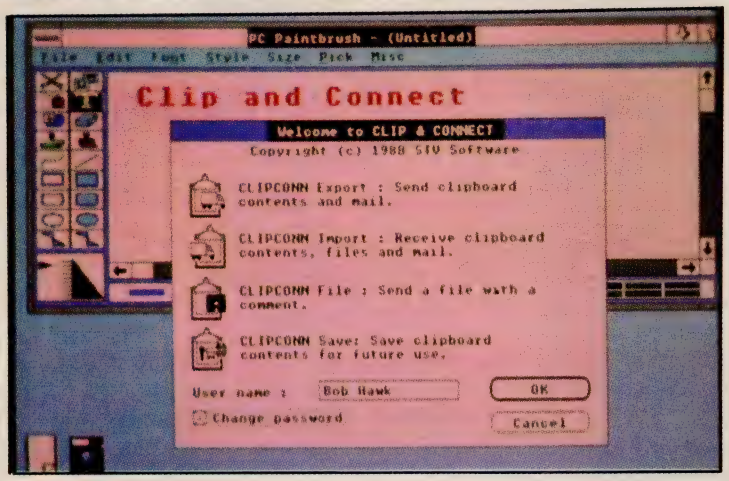
bedford

Comfortable Software™

Exclusive Australian Distributor Ovation Software Pty. Ltd. 11A Gilliver Avenue, Vaucluse, NSW 2030

*US publication

Clip & Connect



Clip & Connect

Software Suppliers
Phone: (02) 387 8166
Price: $130

Clip & Connect is a Microsoft Windows utility in four modules. Clippconn Save expands the capacity of the clipboard to enable it to take up to 20 different 'cuts' which are stored sequentially; there are also 20 levels in the undo facility. The Clippconn Import and Export modules are a flexible electronic mail faculty that can be used for messaging or exchanging documents; the associated Continuous Transmission mode can be used to send text blocks from different files or data from different applications. Clippconn File is used to send complete files between users, rather than just the clipboard contents.

Head cleaner

TIC Distributors
Phone: (02) 938 1566
Price: Not supplied

The Streamclene data cartridge drive head cleaning system is designed to clean 1/4 inch tape drives with a radially oscillating wiper arm (conventional cleaners use a horizontal motion which subjects the heads to continuous impact, a common cause of misalignment and premature wear). The capstan-driven system functions automatically and is compatible with all type of tape drive.

Oxplot

Siemens Ltd
Phone: (03) 420 7204
Price: Not supplied

Designed for use with Siemens' HighPrint PT88S, PT89S, PT90 ink-jet printers and the PT10 laser printer, Oxplot converts files containing plotter commands so that they can be printed on a laser printer. Each of the printers mentioned can

DO YOU CLEAN YOUR COMPUTER REGULARLY?

If not, you are certainly putting at risk the important data stored in your computer! Even a microscopic build up of contaminants on the read/write head can wipe out data completely, while dirty screens and keyboards increase the chance of user error.

So don't wait until your computer starts to misread or misplace information. Clean regularly with AF computer cleaning products. Designed, developed and perfected for complete computer care.

- VDU Screen Cleaning
- Case and Keyboard Cleaning
- Exterior Cleaning and Static Control
- Printer Cleaning
- Diskette Drive Head Cleaning
- ¼" Data Cartridge Drive Head Cleaning
- Tape Drive Cleaning
- Card Reader Head Cleaning
- Technical Maintenance
- Kits

Available from your local computer supplies dealer or send this coupon to: **T.I.C. DISTRIBUTORS PTY. LTD.**
P.O. BOX 339, BROOKVALE 2100.

NAME: .....

ADDRESS: .....

..... PHONE NO: .....

AUSTRALIAN NATIONAL DISTRIBUTOR OF AF PRODUCTS

TIC DISTRIBUTORS PTY. LTD.
UNIT 3/98 OLD PITTWATER ROAD,
BROOKVALE N.S.W. 2100
TELEPHONE: (02) 938 1566
FAX: (02) 938 1467

POCKET ROCKET

NOW WITH 2400 bps

Never before, in the history of communications, has so much performance been packed into such a small space.

The new NetComm Pocket Rocket not only provides bulletin board access at 300bps, Austpac at 1200bps and Viatel at 1200/75bps, it also delivers the speed and economy of 2400bps full duplex communications – a full 1234!

That's an A4 page of text to or from anywhere in Australia in 10 seconds flat!

Pocket Rocket plugs straight into your PC's serial port. And with its rechargeable NiCad battery it can link your lap-top to the phone for the ultimate in communications freedom.

Pocket Rocket supports both CCITT and Bell standards so you can use it anywhere in the world.

And while it's small it has all the big modem features you could want, including auto dial, auto answer and auto disconnect.

To find out more about NetComm Pocket Rocket 1234, the perfect modem for fast workers, from the fastest workers in the modem business, clip the coupon or see your NetComm dealer.

NSW: P.O. Box 284, Pymble NSW 2073. Tel: (02) 888 5533.
VIC: (03) 696 2222. QLD: (07) 221 1409. WA: (09) 367 0613.
NZ: (09) 543 147, (04) 857 727.

NetComm

Pocket Rocket

Please send me more information on Pocket Rocket 1234.

Name: _____

Company: _____

Address: _____

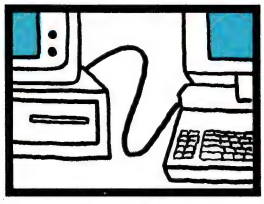
Postcode: _____ Phone: _____

NE45

YC 03

NEW RELEASES FROM PC EXTRAS

SOFTWARE FOR PEOPLE ON THE MOVE

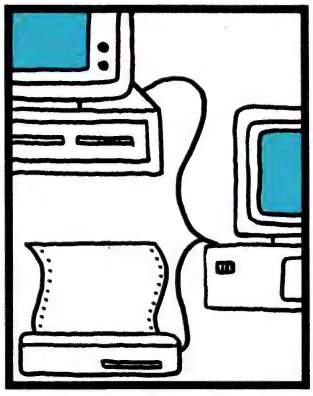


LAPLINK

The fast, easy way to transfer information

Connect any two lap or desktop PCs, including the new PS/2s, with the supplied cable, type LL on both computers and you're connected! Copy files, directories, disks, in either direction, in seconds. LapLink works at an amazing 115,200 baud (bits per second).

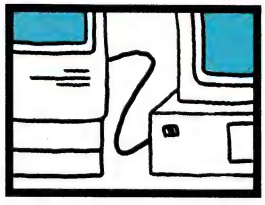
- Full error checking
- Split screen windows show files on both computers.
- File tagging by name, time, new or updated.
- Faster than disk copying.



DESKLINK

An instant network, with messaging! DeskLink connects two computers up to 100 feet apart with standard phone wire.

- Transfer rate up to 115,000 BPS
- Background disk drive and printer sharing capabilities.
- Set up in a few seconds
- Print spooling
- Pop-up "talk box" for sending messages
- Fully compatible with "big" networks



LAPLINK MAC

All the facilities of LapLink, between any IBM PC compatible and any Mac!

- Speeds up to 57,600 baud
- Transfer IBM subdirectories to Mac Folders and vice versa.
- Compatible with Mac Finder, Multifinder and IBM and Apple networks, including AppleTalk, TOPS, 3Com and Novell.

BATTERY WATCH

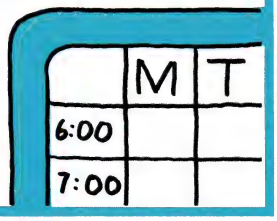
At last, a reliable and accurate battery monitor for your laptop PC.

- Keeps track of your battery's true reserves.
- Retains your battery's memory to accept full charge
- Supports all popular models

ACT! CONTACT MANAGEMENT SYSTEM

This is the only software system that keeps you on top of your contacts and ahead of time!

- Manages your contacts with two profile screens
- Organises your schedule/appointments
- Writes letters
- Files your notes and keeps them organised and accessible
- Keeps a history of every contact.
- Week at a glance, meeting scheduling and alarm functions.



AUSTRALIA'S TOP 1000 COMPANIES

Ready to conduct your own marketing campaign from your desktop? Then you need Australia's Top 1000 Companies Listing.

- Professionally researched, entered and updated – Australia's most accurate listing. ■ Ready to import into your database, wordprocessor or list management program. ■ Each company entry has names of five key executives, phone numbers, fax numbers, details of the type of computer equipment used, etc. ■ IBM or Apple Mac compatible

Carry out your next direct mail or telemarketing campaign from your desktop!

YES! PLEASE SEND ME FURTHER INFORMATION

Name _____

Company _____

Address _____

_____

_____ Postcode _____

Phone _____

- ☐ Laplink
- ☐ Laplink Mac
- ☐ Desklink
- ☐ Battery Watch
- ☐ ACT!
- ☐ Top 1000

pc extras

BRISBANE
Ph: (07) 281 8231

PC Extras
86 George St.
(PO Box 136)
Redfern NSW 2016
Ph: (02) 319 2155
Fax: (02) 698 9926
MELBOURNE
Ph: (03) 486 1999

Brother laser printers

Brother laser printers

Brother Industries
Phone: (02) 887 4344
Price: $4625 HL8e
$6995 HL-8D
$8950 HL-8PS

The eight-page per minute Canon-engined HL8e, designed for desktop publishing and CAD/CAM applications offers, is a LaserJet II compatible 300dpi laser printer with 1Mb RAM (expandable to two); it is supplied with 34 fonts (seven resident), including the HP-GL stroke font. The HL-8D is similarly configured but adds a second 200-sheet input tray for double-sided printing. The PostScript version of the series, the HL-8PS, has 34 resident fonts, 2Mb RAM (expandable to six), an enlargement facility, and an optional AppleTalk cartridge.

print any CAD/CAM output that contains the Hewlett-Packard 7475A driver. Paper format, line thickness and plot raster can be modified using a text editor.

Table Tools

Trio Technology
Phone: (03) 521 0099
Price: $675

Table Tools (for the Macintosh) is a desktop publishing program aimed at graphic artists and others who need to create presentation quality financial and scientific tables. Tables can be created from 'scratch' with a set of powerful text and graphics tools or users can apply and edit supplied stylesheets. Each cell of the table can hold either text or graphics in multiple fonts, styles and formats, including 24-colour bit graphics; multiple cells can be grouped to form larger cells. Data can be imported directly into a table from most popular word processor and database applications. A module supplied with the application, Within Shuttle, allows users to retrieve data and pictures from spreadsheet and graphics programs without quitting the program; special links are provided for Microsoft Excel users. Tables are saved in either PICT or colour PICT format and can be exported directly to such desktop publishing programs as PageMaker, Ready Set Go! and Quark Express.

Laplink III

PC Extras
Phone: (02) 698 9926
Price: $190
$110 upgrade

Traveling Software have released a new version of their popular 'connectivity system.' Laplink III provides error-checked transfers between laptop and PC-compatibles and PS/2 machines at 200,000 bits per second for serial transfers and 500,000 bits per second over parallel connectors. A new 'self-cloning' feature automatically installs a copy of the software on the connected system if it isn't there already. Other enhancements include a tagging option that works with whole sub-directories; automatic batch transfers, and a floppy disk back-up feature that produces a summary of the files on the back-up floppies.

Hi-dos 4.1

Microgram Computers
Phone: (043) 32 8651
Price: not supplied

The latest version of the Hi-dos operating system for PCs includes 43 and 50-line text modes and full-colour screens. (Using Hi-dos' SYS command the system can be installed over any 3.*x* version of MS or PC-DOS.) Other features include a full-screen ASCII with search and replace functions, block editing and margin and text justification. Supplied on a single disk, the 115 commands include enhanced versions of RENDIR, WHEREIS, MODE, TYPE, FIND, CHKDSK, DISKCOPY, FORMAT and CD as well as HI-DISK.SYS, a partition manager that allows partitions up to two gigabytes in size. Various levels of security are provided as are an undelete command, ten memory-resident utilities, and on-line help.

Upgrade monitors

Interleave Pty Ltd
Phone: (02) 748 3999
Price: see below

Interleave, an associate company of Star Micronics, are now importing a range of monitors from US-based Sonica. The range includes: the 220G (a 640 *x* 200, 12-inch composite monochrome monitor), $195; the 250G (a 720 *x* 350, MDA, EGA and Hercules, 12-inch TTL green monitor), $220; and the 450W (a 720 *x* 350 MDA, 640 *x* 200 CGA, RGBI, 14-inch monitor), $290. The range also includes two VGA monitors: the 4580 is a 14-inch high-resolution monitor ($1090) and the 4375M is MDA, CGA, EGA, PGA and VGA compatible ($1290). All prices untaxed. □

ASSEMBLING QUICKBASIC - Part 5

So far in the discussion of assembly language routines for QuickBasic, only integers have been considered. Of the other possible variable types, strings are most likely to be useful. Jeff Richards continues. . .

ALTHOUGH QUICKBASIC provides an extensive range of functions for string handling, each one extracts a considerable overhead in processing time. New string storage areas must be allocated, strings copied from source to destination, and unused areas reclaimed. Specialised assembly language routines for string handling can make a significant improvement to the performance of QuickBasic.

There are limits on the type of string operations that can be performed in assembly language routines. As a general rule, any operation that alters the length of the string cannot be implemented in an assembly language routine. They are therefore most useful for operations that scan strings for characters or patterns, or perform string character conversions *in situ*.

The QuickBasic example in Listing 1 will scan a string and check that all characters in the string fall into a specified range of ASCII values. The routine could be used to scan user input to check that, for instance, the string consisted of all numeric characters.

The equivalent assembly language procedure is presented in Listing 2. The difference in dealing with strings compared with integers – apart from the actual operations performed – arises from the way the string is accessed. While obtaining the value of an integer variable is a two-stage process, accessing the characters of a string variable involves three separate steps.

The first step is to obtain the value of the argument passed from the calling program. Remember that QuickBasic passes all arguments as two-byte addresses, and this includes strings. In the example presented here, the string is the first of three arguments; it was therefore pushed onto the stack first, so it will be found three levels (six bytes) up. The stack offset is four bytes, so the code 'mov bx,[bp+10]' will load the value of the string argument into register BX.

```
FUNCTION CHECK% (I$, N%, M%) STATIC
    F% = -1
    FOR I%=1 TO LEN(I$)
        X% = ASC(MID$(I$, I%, 1)
        IF X% ( N% OR X% ) M% THEN F% = 0
    NEXT I%
    CHECK% = F%
END SUB
```

Listing 1. *This QuickBasic program will scan a string and check that all characters in the string fall into a specified range of ASCII values. Although this function consists of just a few lines, it includes a large number of calls to built-in functions, and is relatively slow.*

This value is an address (remember, QuickBasic passes all. . . and so on) so the value we are after is actually [bx], or 'the contents of the memory location referred to by the value in register BX.' But this is not the string! It is instead a data structure called

```
ALoop:  cmp   byte ptr [bx],al ;11 Check against lower limit
        jb    Errx             ;12  and take error exit if fail
        cmp   byte ptr [bx],ah ;13 Check against upper limit
        ja    Errx             ;14  and take error exit if fail
        inc   bx               ;15 Bump the pointer
        loop  ALoop            ;16  and repeat until end-of-string
AExit:  mov   ax,-1            ;17 Return TRUE
        pop   bp               ;18
        ret   6                ;19
Errx:   xor   ax,ax            ;20 Return FALSE
        pop   bp               ;21
        ret   6                ;22
Check   ENDP
DOSSEG
PUBLIC Check
;*****************************************
;* FUNCTION CHECK% (I$, N%, M%)          *
;* RETURN TRUE IF NO CHARACTERS OF I$ ARE *
;*  OUTSIDE THE (ASCII) RANGE N% TO M%.   *
;*****************************************
Check   PROC
        push  bp               ;1  Save Stack Pointer
        mov   bp,sp            ;2  Make BP the frame Pointer
        mov   bx,[bp+10]       ;3  Get address of string descriptor
        mov   cx,[bx+0]        ;4  Get string length into CX
        jcxz  AExit            ;5  Exit if null string
        mov   bx,[bx+2]        ;6  Get address of 1st character
        mov   dx,[bp+8]        ;7  Get low parameter
        mov   al,[dx]          ;8   into AL
        mov   dx,[bp+6]        ;9  Get high parameter
        mov   ah,[dx]          ;10  into AH
```

Listing 2. *The assembly language equivalent of Listing 1.*

a string descriptor. It is a very simple data structure, consisting of just two words. The first is the current length of the string. The second is the address at which the first character of the string will be found.

So we have BX pointing to a string descriptor that consists of the string length and the address of the first character. The code 'mov cx,[bx]' loads the length of the string into CX. (To code this as 'mov cx,[bx+0]' is pedantic, but perhaps makes it clearer that we are actually accessing the first word of the string descriptor.) Line 5 tests this value, and if the string is currently null the routine branches straight to the end. Note that a null string causes the function to return 'True'

The choice of the CX register to hold the string length is not arbitrary – it will be used as the loop counter when the string is examined character by character. If the string has characters to process, then we can continue on to the third stage of accessing the characters in the string. BX still points to the string descriptor. Therefore the first character of the string is at the address stored at location BX+2 – the second word of the string descriptor. In assembler notation this is referred to as [BX+2], or 'the contents of the memory location referred to by the value stored two bytes beyond where BX is currently pointing.' Line 6 loads this address into BX, overwriting the address of the string descriptor. Loading a register with the contents of an address calculated using the current contents of that same register may look strange, but it is perfectly legal.

The above description involves an addressing procedure that could be called 'Double indirect.' A diagram makes it much clearer – if 'TEXT' was passed as the first of three parameters, then the memory layout would look like this:

```
Increasing      Stack       String              String
Memory                      Descriptor          Storage
Addresses                                       Byte 3 "T"
          SP+10 Arg 1 --                        Byte 2 "X"
  |       SP+8  Arg 2  |                         Byte 1 "E"
  |       SP+6  Arg 3  |    Word 1 (uf1970) Address --> Byte 0 "T"
  |       SP+4  Word   |--> Word 0 (uf1970) Length (4)
  |       SP+2  Word
  |       SP -> Word
```

AL and AH are loaded with the other two arguments (using DX as the index register – BX is otherwise engaged) and the string is checked character by character. Note that the characters in the string are not actually loaded into a register – the compare instructions in lines 11 and 13 compare AL and AH to the memory location pointed to by BX.

Because the string length was loaded into CX, the LOOP instruction can be used to automatically examine the correct number of characters. However, register BX has to be explicitly incremented each time through the loop in order to address each character in turn. If the loop gets to its end without an error, then a value of TRUE (-1) is loaded into AX and the routine terminates. If a character was found that is outside the legal range, then a jump to Errx loads a result of FALSE and terminates the routine. □

LOOK

IBM COMPATIBLES from $999.00
MONITORS from $129.00
HARD DRIVES from $399.00
PRINTERS from $359.00

For one of Australia's biggest names of inexpensive Public Domain Software (from $10.00)
FREE CATALOGUE

For all hardware, software and peripheral equipment for the lowest prices in the computer world for service and assistance

WHO?
uni systems (02) 905 0031

We reserve the right to change prices without notice.

CPM ALIVE!

In January, Tom Moffat described how to upgrade a PC with an NEC V20 and introduced V2080.COM, which allows CP/M software to run under MS-DOS – but why not write your own program using the V20's 8080 mode?

AN INTERESTING fact of life is that MS-DOS was born and bred of CP/M. This means that there are some remarkable similarities between the two, and it shouldn't take too much fiddling to make programs written for one system to run on the other, once we get past the problem of different machine codes for different microprocessors. The V20 is quite capable of running the 8080 code used in CP/M programs; all we have to do is tell it to switch 'modes'.

First let's consider what's required in a CP/M computer. We obviously need an area of memory, and in 'classic' CP/M this is restricted to the maximum addressing capability of the 8080 processor, 64 kilobytes. This just happens to be the size of one complete memory segment which the 8088 can address.

CP/M also supplies a library of machine code subroutines which the program can use to do such things as write a character on the screen, get input from the keyboard, read from or write to disk drives, send a character to the printer, or whatever – these are its 'function calls'. CP/M must also be able to interpret whatever commands the operator types on the keyboard when there is no CP/M program running, such as telling it what program to run or asking it what programs are available. These functions are performed by the CCP (Console Command Processor). Some versions of CP/M have the CCP buried inside them; others have it as a separate file on the disk called CCP.SYS. With MS-DOS the CCP is a separate file, COMMAND.COM.

In CP/M the function calls are all accessed through one channel physically located at Memory Address 5 in its 64 Kbyte memory allocation. To use a function, such as to print a character on the screen, we must first program the 8080's C register with the number of the function we intend to use (2 in this case), and the E register with the character we wish to print. We then issue the machine code instruction CALL 5. Location 5 sends the program off into an area of code inside CP/M. The first thing CP/M does is to look

CP/M	BOTH	FUNCTION
	00	Program terminate
	01	Character input with echo
	02	Character output
	03	Read character from serial port
	04	Send character to serial port
	05	Send character to printer
	06	Direct console I/O
07		Get IOBYTE
08		Set IOBYTE
	09	Send a character string to screen
	0A	Read a line from the keyboard
	0B	Check if character available from keyboard
0C		Get CP/M version number
	0D	Disk reset
	0E	Set default disk drive
	0F	Open file
	10	Close file
	11	Search for first match file name
	12	Search for next match
	13	Delete file
	14	Sequential read
	15	Sequential write
	16	Create or truncate file
	17	Rename file
18		Return login vector
	19	Returns drive code of default drive
	1A	Set DTA address
1B		Get allocation address
1C		Write protect disk (temporary)
1D		Get R/O vector for write-prot drives
1E		Set file attributes
1F		Get disk parameters
20		Get or set user number
	21	Random read
	22	Random write
	23	Get file size in records
	24	Set random record number
25		Reset Drive
26		Write random record of zeros

Table 1. *The function numbers listed in the BOTH column apply to both CP/M and MS-DOS, while those in the CP/M column apply to CP/M only, so the calls are not 100 per cent compatible. But those calls missing are mostly functions that MS-DOS doesn't use at all. For instance there's no such thing as an IOBYTE under MS-DOS. And if your program used function number 0C (hex) to get the CP/M version number, it would be in for a rude shock under MS-DOS. The other missing functions are not used often by CP/M. If they are required, they simply won't be there.*

at the number in the C register and then jump to a subroutine the number represents.

Now it just so happens that MS-DOS works in much the same way. You load one register with the number of the function you require, another register with the data the function is to use, and then issue the instruction INT 21. But a fact not generally known is that MS-DOS also has that CP/M-style channel laid in there at Memory Address 5 in the 64 Kbyte segment being used by the current program. This was apparently put there in the early days of MS-DOS so CP/M programmers would feel at home. The plot thickens! And, to top it off, similar function calls in both CP/M and MS-DOS are *numbered the same!*

Now – refer to Table 1 and you can see that we can use CP/M function numbers, and get at the MS-DOS functions by issuing the CALL 5 instruction, just like in 'real' CP/M. All we have to do is set up the various registers with the function number and the data to be used.

If you now refer to Table 2 you'll discover some more interesting goodies. And, when running in the 8080 mode, the 8080 registers automatically become the appropriate 8088 registers. *They are the same!*

Now let's consider a plan of attack to run a CP/M program on the V20. We are going to write an MS-DOS program in Assembler language to define an area which will become 'CP/M'. The program will also need to load the CP/M program into this special area and then start it running. The MS-DOS program will also have to handle function calls that come from the CP/M program. Finally, the MS-DOS program must take over when the CP/M program finishes, and exit gracefully.

We must keep in mind that special forms of the 8088's software interrupts are used to jump back and forth between 8088 and 8080 operation. (In V20 language these are called 'breaks', but they are the same thing.) Two new interrupts will be required, one to start a CP/M program running, and the other to temporarily revert to 8088 operation for MS-DOS function calls. These two interrupts will be assigned numbers, just like all the other interrupts the 8088 uses. But we must be absolutely sure the numbers we use aren't used elsewhere in the computer, or we'll have big troubles!

It is first necessary to set up a 64 Kbyte segment which is going to become our CP/M computer. This could be defined as the area just above the MS-DOS program which we are now writing. This segment just looks like data at this stage. At address 5 in this segment we must embed the new 8080 instruction that kicks the V20 back to 8088 mode and sends it off to do an MS-DOS function call. The actual machine code bytes to do this, in hexadecimal, are ED ED followed by an MS-DOS interrupt number. Since this is a 'call', instead of a 'jump', it will probably be necessary to follow this code with an 8080 return instruction to get back into the proper part of the CP/M program.

There must also be an escape route where the CP/M program can jump to when it is finished executing. This is normally Address 0, which warm-starts CP/M. At our Address 0 we will embed another new 8080 instruction, ED FD, which terminates the 8080 mode and restarts the MS-DOS program that initiated 8080 operation in the first place.

We must now tell MS-DOS where this 'CP/M' segment is, by using function 25h to set up an interrupt vector. The segment register must point to our new segment, and the offset must point to address 100h within it, where the CP/M program will start executing.

The next step is to load the desired CP/M program into this new segment, starting at address 100h in the normal way. Remember we're still running MS-DOS at this stage, reading the disk and treating what we get as simple raw data. With this done we should be left with a 64 Kbyte chunk of memory with 'ED ED nn' at location 5, 'ED FD' at location 0, and the CP/M program at location 100.

The 8088 instruction to fire up the V20's 8080 mode is called BRKEM, followed by the interrupt number we just established above. Now your trusty 8088 assembler won't know about such a silly instruction as BRKEM and it will complain bitterly if you try to convince it otherwise. So we will have to encode the instruction manually, as a data statement –

```
DB  0F,FF,nn  ;BRKEM nn
```

– where 'nn' is the interrupt number. When the V20 hits this machine code sequence all hell will break loose. The important operating parameters of the calling MS-DOS program will be saved, the V20 will spin its wheels, grab the segment and offset addresses from the interrupt vector, jump into the new CP/M segment, and start interpreting everything from then on as 8080 code.

Right! That's the CP/M segment taken care of (I hope . . . remember, this hasn't been tried). What we haven't done yet is tell the V20 where to jump to when it cops a CALL 5 from the CP/M program. This means setting up another interrupt vector, again using MS-DOS function 25h. This time it would be a good idea to divert the V20 into our main calling program, to conduct a few tests before doing an MS-DOS function call.

The idea is to trap any CP/M calls that are not properly implemented in MS-DOS, before they can cause any crashes. The safest way would be to check for good ones, and reject everything else. This could be done by listing the numbers of 'good' calls in a table. We could then use the 8088 instruction SCASB to make sure the desired instruction was in the table. Any duds would be rejected, with an appropriate error message. If the search was successful the program could then jump to Location 5 below the MS-DOS program, from where it would be sent on to the DOS functions.

In summary then, we have established a special segment for running CP/M programs. We have set up one interrupt vector to jump from the main MS-DOS calling

USE OF REGISTER	CP/M	8088	V20
FUNCTION NUMBER TO PERFORM	C	= CL	= CL
8-BIT DATA INPUT TO ROUTINE	E	= DL	= DL
16-BIT INPUT TO ROUTINE	DE	= DX	= DW
16-BIT OUTPUT FROM ROUTINE	HL	(not used)	
---> MAKE IT ALL HAPPEN	CALL-5	CALL-5	CALL-5

Table 2. *The registers used by CP/M and MS-DOS (using CALL 5) to pass information to and from DOS function calls. The 8088 and the V20 are shown separately, because the official register names differ somewhat, but they are the same as far as programming is concerned.*

Some further explorations

SINCE THE preparation of the V20 article which appeared in the January issue, I've had some time to further examine the use of the V20 chip in the 8080 emulation mode; that is, running CP/M programs. I must admit that I originally saw the feature as an interesting novelty and little else. But now, after several months of working with it, the 8080 feature has proved downright useful!

One interesting CP/M program which has no direct MS-DOS equivalent is Roots, a database for your ancestors with facilities for searching, working out relationships, constructing family trees and so on. It's quite an elegant program, written in the early 1980s, and like most programs of this vintage, it's in pure 8080 code (no Z80 code). So it's quite compatible with the V20. I decided to use Roots as an example, to see just how well a CP/M program could be made to work on an IBM-PC.

Prior to optimizing Roots for the IBM, I gave it a really good thrashing on a Microbee to see what it could do. It was well behaved, producing some lovely screen displays of family trees complete with rudimentary ASCII graphics and highlighted video. The program has been set up to work with an ADM-3 terminal.

When transferred straight into the IBM PC via PC-Alien, and running under the V2080 program, Roots had trouble with its screens, writing data on top of other data, erasing in the wrong place, and generally making a mess of other things. Since there wasn't a lot of information with the V2080 program, a good old-fashioned hack was in order to find out to find out what was going on.

Looking into V2080.COM with Debug, the first thing you see is a message: 'Watch it now, no peeking'. Later, 'Oh, dear, you are looking around in here? Sigh . . . ' and later still 'I do not suppose asking you nicely to not steal my code would make any difference would it?' Is the author of V2080 a humourist or a pessimist? Anyhow, amongst all the chatter is some useful information.

00	(Aborts program)	0D	Carriage return
07	Bell	17	Clear to end of screen
08	Backspce	18	Clear to end of line
0A	Line feed	1A	Clear screen and Home
0B	Cursor up	1E	Home, does not clear screen
0C	Cursor forward	1B-3D	Cursor addressing, (20,20) offset

Control codes that V2080 responds to.

Some, but not all, of the ADM-3 terminal control codes seemed to work with the IBM PC and since the PC doesn't normally know of such things, the smarts had to come from within V2080. Also, the ANSI screen controls, which the PC does know about, didn't appear to be making it through V2080. As it turns out, V2080 has its own little terminal emulator, which looks at all incoming codes, acts on some, and throws others (including ANSI sequences) away. What's left are sent straight to ROM BIOS routines, bypassing MS-DOS.

I used Debug to search for machine code 'compare' instructions to see what special codes V2080 was interested in. I then wrote a small CP/M program to send keystrokes straight to the VDU to see what results these codes had on the screen. The results are shown in the table accompanying this box item. The type of terminal emulated appears to be a Kaypro II computer. Aha!

Installing Roots on the PC using these codes produced fine results. The only feature really missing was a way to produce highlighted or inverse video.

One feature of Roots is the ability to use graphics characters, instead of ASCII characters, to draw lines for the family tree. For this to work on the PC, all 8 bits of each character, that is codes above 127, must be available. V2080 prevents this by setting the high bit of each character to 0, but a small hack on V2080 will fix this. Use Debug to change these memory locations from 7F to FF: 079B, 08E3 and 0970. do this on a copy of V2080, not your original.

Eight-bit characters will now come through V2080 unscathed, but other programs may cause problems. The very first one I tried was a version of Forth that sets the high bit at the end of each word, like WordStar does. This produced gibberish on the screen, so I reverted back to the original version of V2080, and reworked Roots to again use the 7-bit ASCII characters to produce graphics.

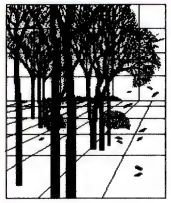
If I were writing a control program for the V20, as described in the main article, I would still send every character from CP/M straight through to MS-DOS instead of building a CP/M type terminal emulator into the program. That way you could use the MS-DOS ANSI driver to produce all the fancy stuff on the screen. Most CP/M programs can be configured to work with ANSI screens by specifying a terminal such as a VT100.

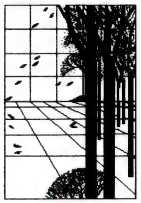
V2080, like the early CP/M machines it emulates, handles each screen display one character at a time. So it's quite slow when refreshing a whole screen. One reason Roots works so well with the V2080 is that it paints a screen, and then you spend considerable time admiring it. The speed of each screen refresh is not so important. But programs like WordStar are changing the screen display all the time, and you really notice the lack of speed. But even with its limitations, V2080 is still very useful.

program into 8080 execution within the CP/M segment. We have set up another interrupt vector to temporarily leave the CP/M segment and return to MS-DOS for a function call. And, we have arranged a way to read a CP/M program from the disk into the proper part of the CP/M program prior to execution. What we haven't done is tested any of this!

If you want to have a crack at writing your own V20-CP/M maker-goer, you should ask for a data sheet for the V20 when you get your chip. The 'sheet' actually runs to about 30 pages, but if you're nice your supplier might help you out. Now, please don't write to me or *Your Computer* asking for further help with the ideas set out above. Remember, they are only ideas, to set you off on the right track. If you want to use your V20 for CP/M straight away, then get a copy of V2080.COM. It's only about 7 Kbyte long so it shouldn't take long to get down from a bulletin board.

This is the end of the V20 story – it was going to be a simple plug-in conversion project, but the deeper I got into it the more the brain cells started churning over, and look where we wound up! I hope you get as much fun out of the V20 as I have. □





VAPORWARE

A Division of Halldale Technologies Pty Ltd

Unit 6 • 282-286 Guildford Road • Guildford • NSW 2161

- We accept Bankcard, Mastercard & Visa
- Freight: $8.00 Post , $12.00 Courier
- Call for products not listed
- Government & Corporate enquiries welcome
- Dealer enquiries welcome
- Phone And Mail Orders Welcomed

CADD PACKAGES

Generic CADD Level 3 inc DotPlot	$330
Generic 3D & Rendering	$435
CADD Symbol Libraries	from $60

COMMUNICATIONS

Brooklyn Bridge *(Serial or Parallel)*	ea $175
Carbon Copy Plus 5.1 *(NEW VERSION)*	$240
DeskLink	$210
LapLink Release 3 *(NEW VERSION)*	$190
Mirror III	$120
PC Anywhere III	$188
Procomm Plus	$120

DATABASE

ARRIBA	$295
D B X L Ver 1.3 *(NEW VERSION)*	$279
C lipper Compiler	$739
FoxBASE Plus 2.10 (Best Price in Australia)	$480
PARADOX 3.0	$750
Quicksilver Compiler Ver 1.3	$750

dB Fast / DOS
DBASE III Plus Compiler
$189.00

NEW

dBFAST / SQL	**$460**
dBFAST / Windows	**$295**
dBFAST / PLUS	**$CALL**
XDB SQL & XDB C	$CALL

DESKTOP PUBLISHING

Ventura Publisher 2.0	$1,095
NewsMaster II	$125
PageMaker 3.0 *(Free Computer Books)*	$15,500
Pizazz Plus	$185
PFS First Publisher V2.0	$170
Publisher's Paintbrush	$380
Ventura Stylesheets (Book + Disk)	ea $55

Select from "Newsletters" or "Technical Documents". Both available for $98

All products are subject to availability and Prices are subject to change without notice.
E.&O.E. YC 8/89

SPRINT
Borland's WordProcessor
$195.00

SPREADSHEET

LOTUS 1-2-3 ***Release 3 .... at last***	**$650**
MICROSOFT E X C E L	$595
LUCID 3D 2.0 *(now with graphics)*	$199
VP-Planner Plus *(SPECIAL PRICE)*	$225
1 to C Spreadsheet Compiler	$450

SPREADSHEET ADD-ONS

101 Macros for Excel, 1-2-3, Symphony, SuperCalc, WordPerfect & more	ea $89
3-2-1 Blastoff *(Accelerator & Security)*	$220
3-2-1 Gosub *(Write your own @Functions)*	$220
Allways *(New from FUNK Software)*	$169
IMPRESS *(Spreadsheet Publisher)*	$199
Individual Training for Lotus 1-2-3	$95
InWord	$109
Look & Link	$139
ProjectCalc*(Project Manager Lotus Add-in)*	$250
Sideways	$99
Spreadsheet Toolbox	$129
SQZ! Plus *(NEW Version)*	$129

UTILITIES

Above Disc Version 2.0B	$150
Athena BIOS *(Runs CGA on Hercules)*	$75
Copy II PC Ver. 5.0	$ 51
Copy II Deluxe Option Board	$199
DESQview 2.2 *(NEW VERSION)*	$165
DESQview 386 *(INCLUDES QEMM)*	$215
DESQview Companion	$109
Direct Access	$145
Disk Technician Advanced	$250
DS Backup Plus	$95
Fastback Plus 2.01 *(NEW VERSION)*	$199
FormTool with Free Greatest Hits	$175
FormWorx with Fill & File	$190
Graph-in-the-Box	$190

Ventura 2.0
Premier Desktop Publishing
$1095.00

MACE Utilities 5.0	$150
MACE Utilities Gold Edition	$195
MenuWorks *(Incredible Value)*	only $79
MemoryMate	$110
Norton Editor	$ 120
Norton Commander 2.0	$112

Ph (02) 681 2722 Fax (02) 632 5298

WORD PROCESSING

MS WORD 5.0 *(NEW VERSION)*	**$489**
WORDPERFECT 5.0	$545
SPRINT *(from Borland)*	$195
Gram•mat•ik III *(Style Checker)*	$115
Legal or Medical Spell Dictionary	ea $99

Microsoft Word
Version 5
$489.00

Norton Utilities Advanced Ver 4.5	$169
PC Tools Deluxe 5.1 *** IN STOCK ***	$99
Print Q *(NEW VERSION 4.0)*	$169
PrintMaster Plus *(With free Fonts & Borders)*	$93
Q.E.M.M. 386 *(Expanded Memory Manager)*	$95
QDOS II	$94
SoftSafe *(PC Data Security)*	$169
Software Carousel 3.0	$159
Sidekick Plus	$249
ViewLink	$199
X-Tree Professional	$149
X-Tree NET	$333

MONTHLY SPECIALS

XTree Pro™
$149.00

PC Tools Deluxe
Version 5.1
$99.00

Mace Utilities
Gold Edition
$194.00

FASTBACKPLUS
$199.00

MICROSOFT SPECIALS

Beat the July 31 Price Increases

QuickC 2.0	$129	Windows 286	$145
QuickBasic 4.5	$129	Mouse & Windows 286	$290
QuickPascal	$139	Windows 386	$260
MacroAssembler 5.1	$205	WORD 5.0	$489
C Compiler V5.1	$579	EXCEL Spreadsheet	$590
MOUSE (Bus or Serial)	$215	Microsoft Works	$225

COMPUTER BOOKS

WordPerfect 5 : The Complete Reference	$46.50
Turbo Pascal 5.5: The Complete Reference	$49.50
DOS : The Complete Reference	$47.50
dBASE III+ : The Complete Reference	$44.50
dBASE IV : The Complete Reference	$49.50
1-2-3 : The Complete Reference	$41.50
1-2-3 : Made Easy or DOS 4 : Made Easy	ea $34.50
Using Quick C 2.0 or Using QuickBasic	ea $36.50
Using Turbo C 2.0 or Using Turbo Pascal 5	ea $39.50
Advanced QuickC or Advanced Turbo C	ea $39.50
Word 5:Made Easy or WordPerfect 5:Made Easy	ea $35.50
Using EXCEL or Advanced EXCEL for the PC	ea $39.50
Using QUATTRO: The Professional Spreadsheet	$38.50
Microsoft Works for the PC	$37.50
The ABC's of AUTOCAD (Release 10)	$40.50
Mastering AUTOCAD (Release 10)	$54.50
Mastering Turbo Pascal 5 (*SYBEX*)	$40.50
The Official Book of King's Quest	$20.50
dBXL and QuickSilver Programming	$45.50
Programming in Clipper (2nd ed)	$52.50
Mastering VENTURA 2.0	$42.50
Ventura by Example by David Webster	$48.50
The Paul Mace Guide to Data Recovery	$42.50

LARRY LEWIS

National BBS listing

Primary electronic collection points

ACT – PC Exchange RIBM (062) 58-1406

NSW – Prophet TBBS (02) 628-5222

Vic. – Custom Programming Opus (03) 848-3331

Qld. – AMPAK Opus/PRBBS (07) 263-7070

SA – Oracle PC-Network (08) 260-6222

WA – Nemo Multiple BBS RAPL (09) 370-1855

Tas. – Hobart Users Bulletin Board (002) 43-5041

VICTORIA

ABE Opus
Sysop: Don Grover
Phone: (03) 288-3599
Baud: V21 V22 V23
Access: Reg LVA
BBSoftware: Opus

AIM – A)ccess I)n M)elbourne
Sysop: David Hellwege
Phone: (03) 592-3338
FIDOnet: 3:634/380
Baud: V22bis
Access: Public
Computer: AT Clone
DOS: MS DOS
BBSoftware: Lynx

AmigaLink
Sysop: Bohdan Ferens
Phone: (03) 792-3918
OZnet: 7:830/324
Baud: V21 V22 V22bis V23

AmigaLink II
Sysop: Gary Gajic
Phone: (03) 376-6385
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: IBM XT
DOS: MS DOS
BBSoftware: Opus

AMNET
Sysop: Peter Hallgarten
Phone: (03) 366-7055
OZnet: 7:832/365
Baud: V21 V22 V22bis V23
Access: Mem Reg VA
Computer: Pulsar 80386
DOS: PC DOS
BBSoftware: Opus

Antarctic Crystal
Sysop: Greg Jones
Phone: (059) 68-5885
OZnet: 7:831/346
Baud: V22 V22bis V23
Access: Mem VA
Computer: IBM AT Clone
DOS: PC DOS
BBSoftware: Opus

ANZUGS CBCS
Sysop: Gordon Castle
Phone: (03) 563-2496
OZnet: 7:833/380
Baud: V22bis PEP
Access: Public
Computer: IBM Model 80
DOS: PC MOS/386
BBSoftware: Opus

Arcadia Opus
Sysop: Andrew Newbury
Phone: (03) 267-8793
FIDOnet: 3:634/385
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

Arts BBS
Sysop: Tal Silberman
Phone: (03) 525-9015
FIDOnet: 3:635/405
Baud: V21 V22
Access: Public
DOS: PC DOS
BBSoftware: QuickBBS

Ballarat C.A.E.
Sysop: Thoshan Ruberu
Phone: (053) 339-285
Baud: V21 V22 V23
Access: Reg VA
Computer: IBM XT
DOS: PC DOS
BBSoftware: Opus

Bayside Opus
Sysop: Paddy Plebanowicz
Phone: (052) 53-1110
FIDOnet: 3:632/313
Baud: V21 V22 V22bis V23
Access: Public
Hours: Weekdays: 1800 – 0730
Weekends: 24 Hours
Computer: IBM Clone
DOS: PC DOS
BBSoftware: Opus

Big Tedd's Bulletin Board
Sysop: Rob Bates
Phone: (03) 509-6067
FIDOnet: 3:634/381
Baud: V21 V22 V22bis V23
Access: Mem Reg LVA
Computer: IBM XT Clone
BBSoftware: Opus

Brainstorm Oz!
Sysop: Rowan Stevens
Phone: (03) 758-7086
FIDOnet: 3:632/322
Baud: V21 V22 V22bis V23 B103
Computer: IBM XT
DOS: MS DOS
BBSoftware: Opus

Comet BBS
Sysop: Caufield High School
Phone: (03) 211-0079
Baud: V21 V22
BBSoftware: IBBS

Commotion Opus
Sysop: Phil Montgomery
Phone: (060) 59-3307
FIDOnet: 3:712/508
Baud: V21 V22 V22bis
Access: Public
Computer: IBM AT Clone
BBSoftware: Opus

Compusoft BBS
Sysop: George Tsoukas
Phone: (03) 386-6019
Baud: V21 V22 V22bis V23 B103
Access: Reg LVA
Computer: Mitac 386
BBSoftware: Opus

Custom Programming OPUS
Sysop: Alan Williamson
Phone: (03) 848-3331
OZnet: 7:831/340
Baud: V22 V22bis
Access: Public
Computer: IBM AT Clone
DOS: PC Dos
BBSoftware: Opus

Delta BBS
Sysop: Big Mother
Phone: (03) 793-4548
Baud: V21 V22 V22bis V23
Access: Public
Computer: Apple //e
BBSoftware: TproBBS

Discovery M.P.BB.
Sysop: David Bowman, Hal 9000 & Marvin
Phone: (059) 75-9058
Baud: V21 V22 V23
Access: Reg VA
Hours: Weekdays: 2100 – 0700
Weekends: 24 Hours
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

Doodz Domain
Sysop: Scott Rigby
Phone: (03) 646-5861
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: QuickBBS

Dr Blaze
Sysop: Ron Lyth
Phone: (03) 890-9323
FIDOnet: 3:634/384
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
BBSoftware: Opus

Dragon City BBS
Sysop: Mal Fields
Phone: (054) 47-0398

Complete BBS Registry listing

We are publishing the complete listing for the ACT and New South Wales in July, October, January and April; the listing for Victoria, Tasmania and the Northern Territory in August, November, February and May; and South Australia, Western Australia and Queensland in September, December, June and March.

Baud: V21 V22 V22bis V23
Access: LVA
Computer: Amiga
DOS: AmigaDOS
BBSoftware: BBS-PC!

Eastcom Opus CBCS
Sysop: Keith Haslam
Phone: (03) 808-0775
OZnet: 7:830/312
Baud: V21 V22 V22bis V23
Access: Public
Computer: Eastcom 386-20C
DOS: PC MOS
BBSoftware: Opus

Eastern Suburb Eighty User Group
Sysop: Martin Axford
Phone: (03) 819-5179
FIDOnet: 3:632/347
Baud: V21 V22 V22bis V23
Access: Public
Computer: Ultra AT
DOS: DOS
BBSoftware: Opus

Eastwood Opus
Sysop: Mick Stock
Phone: (03) 870-4623
OZnet: 7:831/343
Baud: V22 V22bis V23
Access: Reg
Computer: IBM AT Clone
DOS: PC DOS
BBSoftware: Opus

GRAAF Central Victoria CBCS
Sysop: Leo Julius
Phone: (054) 73-4217
FIDOnet: 3:634/383
Baud: V21 V22 V22bis V23
Access: Mem Reg LVA
Computer: GRAAF 386
DOS: PC DOS
BBSoftware: Opus

Island BBS
Sysop: Ross Skinner
Phone: (03) 742-3993
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
BBSoftware: QuickBBS

L & A Opus BBS
Sysop: Phillip Kelly
Phone: (03) 800-3215
OZnet: 7:831/327
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: IBM AT
DOS: PC DOS
BBSoftware: Opus

Little Shop of Horrors
Sysop: John Marsden
Phone: (03) 583-4778
FIDOnet: 3:633/364
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT
DOS: MS DOS
BBSoftware: QuickBBS

MainframeZ BBS
Sysop: Andrew Whittle
Phone: (03) 466-2006
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: QuickBBS

Maxitel BBS
Sysop: Galvatron
Phone: (03) 560-9292
Baud: V21 V22
Access: Public
Computer: C-64
BBSoftware: ARB BBS

MBUG Australia Inc
Sysop: Mike Thompson
Phone: (03) 882-9421
FIDOnet: 3:633/362
Baud: V21 V22 V22bis V23
Access: Mem LVA

Melbourne Data Exchange
Sysop: Robert Broomhead
Phone: (03) 561-6556
OZnet: 7:832/360
Baud: V22 V22bis V23
Access: Reg VA
Computer: IBM Clone
DOS: MS DOS
BBSoftware: Opus

Melbourne Forth Interest Group
Sysop: Lance Collins
Phone: (03) 809-1787
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Mercury BBS
Sysop: Nils Desperandum
Phone: (03) 887-1485
Baud: V21
Computer: C-64
BBSoftware: C-Net

MESA RBBS
Sysop: David Woodberry & Bob Stafford
Phone: (03) 563-9102
FIDOnet: 3:632/349
Baud: V21 V22 V23
Access: Mem Reg VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Micom CBCS
Sysop: Peter Jetson
Phone: (03) 758-8642
FIDOnet: 3:633/371
Baud: V21 V22 V22bis V23
Access: Mem Reg
Computer: IBM Clone
DOS: MS DOS
BBSoftware: Opus

Microscience Computers BBS
Sysop: Stephen Rivenell
Phone: (03) 786-7187
FIDOnet: 3:635/400
Baud: V21 V22 V22bis
Access: Public
Computer: FireStar 286
DOS: MS DOS
BBSoftware: Opus

Omega BBS/Vortex Host
Sysop: Mark Gregson

Sonics

throw some light on your music-making

For subscription details, call (02) 693 6666

Phone: (052) 22-1670
Baud: V21 V22 V22bis V23 B103
Access: Public
Computer: IBM AT
DOS: Xenix
BBSoftware: Xenix BBS
Note: To connect @ V22bis, send a break when you have carrier & see garbage on screen

Osborne Australian BB
Sysop: Craig Orr
Phone: (03) 890-4096
Baud: V21 V22 V22bis V23
Access: Reg LVA
BBSoftware: Searchlight

Pacific Island
Sysop: Craig Bowen
Phone: (03) 890-2174
Baud: V21 V22 V22bis
Computer: Apple
BBSoftware: GBBS

PC Connection IBBS
Sysop: Lloyd Borrett
Phone: (03) 388-0909
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT
DOS: MS DOS
BBSoftware: IBBS
Note: This system runs 4 lines on the above number.

Peninsula Colour Computer Club BBS
Sysop: Stan Blazejewski
Phone: (03) 580-4605
Baud: V21
Access: Reg LVA
Hours: Daily: 2130 – 0700
Computer: Tandy CoCo I
BBSoftware: Colorama

Sam's Opus BBS
Sysop: Alan Haslar
Phone: (03) 563-1117
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: Opus

SMART BBS
Sysop: Richard Hoskin
Phone: (03) 602-1336
FIDOnet: 3:632/302
Baud: V21 V22 V22bis
Access: Mem VA
Computer: ALR 386
DOS: PC DOS
BBSoftware: Opus

Southern Mail
Sysop: Maurie Halkier
Phone: (03) 725-1621
OZnet: 7:830/320
Baud: V22 V22bis PEP
Access: Public
Computer: Eastcomm PC/XT
DOS: PC DOS
BBSoftware: Opus

Tardis II
Sysop: Malcolm Miles
Phone: (03) 859-3109
Baud: V21 V22 V22bis V23
Access: Public
Computer: PC
DOS: Concurrent DOS
BBSoftware: CALLME/GOLIATH

Telegraph Road BBS
Sysop: Darren Moore
Phone: (03) 743-6173
FIDOnet: 3:633/361
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT
DOS: PC DOS
BBSoftware: QuickBBS

The Amiga Limits
Sysop: Captain Kirk
Phone: (03) 725-2895
Baud: V21 V22 V23
Access: Reg VA
Computer: IBM AT
DOS: PC DOS
BBSoftware: QuickBBS

The Bridge
Sysop: David Beckwith
Phone: (03) 563-8070
Baud: V22 V22bis
Access: Public
Computer: Sharp PC 7100
DOS: MS DOS
BBSoftware: Opus

The CadPhone
Sysop: Stuart Szabo
Phone: (03) 890-0091
FIDOnet: 3:633/367
Baud: V21 V22 V23
Access: Public
Computer: HP Vectra 286
DOS: PC DOS
BBSoftware: Opus

The Crossover
Sysop: Stephen Paddon
Phone: (03) 367-5816
Baud: V21 V22 V22bis V23
Computer: IBM AT
BBSoftware: QuickBBS

The Domestic Engineer
Sysop: Rob Roder
Phone: (03) 720-6356
Baud: V21 V22 V22bis
Access: Public
Hours: Daily: 2130 – 0730
Computer: XT Clone
DOS: MS DOS
BBSoftware: QuickBBS

The Further Regions
Sysop: The Outsider
Phone: (03) 725-1923
FIDOnet: 3:633/375
Baud: V21 V22 V22bis V23 B103
Access: Public
Computer: IBM XT Turbo
DOS: MS DOS
BBSoftware: QuickBBS

The Hot-Line
Sysop: Mark Firus & Darren King
Phone: (03) 547-5117
Baud: V22 V22bis B103 B212
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

The Labyrinth BBS
Sysop: Stephen Jones
Phone: (03) 328-2379
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

The National CBCS
Sysop: John Blackett-Smith
Phone: (03) 885-6904
OZnet: 7:830/301
Baud: V22 V22bis PEP
Access: Public
Computer: IBM AT
DOS: MS DOS
BBSoftware: Opus

The Outer Limits
Sysop: Captain Kirk
Phone: (03) 725-6650
Baud: V21 V22 V23
Access: Reg VA
Computer: IBM AT
DOS: PC DOS
BBSoftware: Opus

The Real Connection
Sysop: The Real Article & Deep Image
Phone: (03) 808-0810
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: DoubleDOS
BBSoftware: Opus
Note: Second Line: (03) 288-0331

The Software Bank
Sysop: Simon Walsh
Phone: (03) 820-1632
FIDOnet: 3:632/301
Baud: V22 V22bis B103 B212
Access: Reg LVA
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

The Twilite Zone
Sysop: Fearless Fred
Phone: (03) 562-0686
Baud: V21 V22
Access: Reg VA
Computer: IBM XT
DOS: MS DOS
BBSoftware: Opus

The Witche's Brew
Sysop: Erika Matlen
Phone: (03) 718-2198
FIDOnet: 3:633/370
Baud: V21 V22 V22bis V23 B103
Access: Public
Computer: IBM XT
DOS: PC DOS
BBSoftware: QuickBBS

Valicomm Opus
Sysop: Bill Walker
Phone: (051) 27-2572
FIDOnet: 3:633/365
Baud: V21 V22 V22bis V32 HST
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Yarra Valley BBS
Sysop: Frank Conner
Phone: (059) 64-3126
Baud: V21 V22 V22bis V23 B103
Access: Public
Computer: C-64
BBSoftware: ARB BBS

Zen BBS
Sysop: Craig Bowen
Phone: (03) 899-6184
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: TBBS

TASMANIA

Hobart File Exchange
Sysop: Harry Vollmar
Phone: (002) 28-4589
Baud: V21 V22 V22bis V23 B103
Access: Public
Hours: Weekdays: 2200 – 1630
Weekends: 2200 – 0900
Computer: Cleveland 286
DOS: MS DOS
BBSoftware: PC-Board

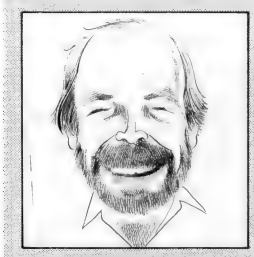
Hobart Users Bulletin Board
Sysop: Alan Hughes
Phone: (002) 43-5041
FIDOnet: 3:670/700
Baud: V21 V22 V22bis V23 B103
Access: Reg VA
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

Tasmanian Amiga Group QBBS
Sysop: Roy Austen
Phone: (003) 44-9762
FIDOnet: 3:670/301
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: PC 8502
DOS: MS DOS
BBSoftware: QuickBBS

Tassie Bread Board System
Sysop: Ian Campbell
Phone: (003) 26-4248
FIDOnet: 3:670/302
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: Kaypro PC
DOS: MS DOS
BBSoftware: TBBS

NORTHERN TERRITORY

ACCENT! Amiga BBS
Sysop: Greg Smith
Phone: (089) 53-2090
Baud: V21 V22 V22bis V23 B103
Access: Mem Reg VA
Computer: Commodore PC10-III
DOS: MS DOS
BBSoftware: QuickBBS



MATT
WHELAN

Execute!

NEED HELP? Try *Norton Guides for Clipper* or Tom Rettig's *Help for dBase, Foxbase and Clipper*. Or cut down Clipper disk-wastage with .RTLink... Okay, I'll start off with an unfair trick to capture the attention of the Clipper users. This Hello.Prg –

```
clear
? "Hello world"
quit
```

gave these file sizes for the .EXE files –

```
HELLO1.EXE   159178
HELLO2.EXE    81088
HELLO3.EXE     1416
```

All three .EXE files were produced with Clipper, Summer '87. All of them work. Got you! Can't walk away from this page until you find out how, right? All right, all right... I'll talk.

It's easy to tell where the first version, Hello1.Exe, came from – a standard Clipper compile. Almost 160,000 bytes of executable just to clear the screen and say 'Hello World'. That's the price we pay, the price we're used to, for Nantucket's belts-and-braces approach to saving programmers from themselves: any Clipper .EXE will be at least that big.

So how do I come to have one that's only 81,000 bytes – around half the size – and another that's an amazing 1416 bytes? I cheated, that's how. Hello2.Exe, the half-size version, has nothing to do with the products I'm discussing, I just threw it in for interest. It's achieved by using dummy assembler modules to override the Clipper library functions.

RTLink is a powerful and versatile linker which can accept both Microsoft (positional) and Plink (freeform) syntax, and has all the features of both linkers.

The technique, which can be dangerous at best, is detailed in ShrinkCl.Arc, available on several bulletin boards. A sample assembler routine is included in the file.

A 1-Kbyte .EXE?

THE THIRD file, Hello3.Exe, is also a trick, of sorts. It was produced with RTLink, an excellent third-party linker for any Microsoft format compiler. The authors of RTLink are pushing it heavily in the Clipper market and have (thankfully) recently reduced its price from $US495 to $195.

RTLink is a powerful and versatile linker which can accept both Microsoft (positional) and Plink (freeform) syntax, and has all the features of both linkers including Plink's exceptional overlay handling. And it has one other feature up its sleeve – it can provide *dynamic linking*. You can use it to produce a run-time library from any combination of libraries, and from then on your .EXE file carries *only* the code not held in the runtime library.

It's the same principle as the MS-BASIC compiler's BRUN – it isn't linked-in to the .EXE file, but needs to be there at execution time. Note this does absolutely nothing for the memory-image size of the .EXE, as the runtime library is loaded at start-up (so our 1416-byte Hello3.Exe will take as much memory when running as Hello1.Exe.

What it does provide, of course, is an incredible saving in disk space for anyone who has more than one Clipper .EXE on disk at one time. Twenty reasonably sized Clipper-compiled utilities would use perhaps a megabyte of disk space, compared to four megabytes without RTLink. I love it! It's written by Pocket Soft, of PO Box 821049, Houston TX 77282; phone (713) 460-5600. Australian distribution is by DBA in Canberra – talk to Dean Spire on (062) 85-2097. □

LEGACY
We need your help... today more than ever.

Please send donations to your nearest Legacy office.

RITA PLUKSS

Basic and emulations

ATARI ST BASIC is changing. The original version was so bad it didn't even make a good Frisbee. The revised versions tried to solve the many problems and shortcomings, but could never match the Basics that were commercially available. Late last year Atari Germany began shipping Omikron Basic as the standard Atari ST Basic and since then 11 European countries have followed the Omikron standard.

Omikron Basic is similar to MBasic and GW Basic for MS-DOS machines. The development package comes with an interpreter, compiler and a large library of precompiled programs for use in specialised applications with routines for GEM, MIDI, numerics, statistics, complex numbers and financial mathematics. These libraries should make it easier for beginners to develop their own applications. Omikron Basic will be marketed in America and Canada, and after a successful

Another bit of Basic information is that MichTron started liquidating their GFA line some months ago. MichTron have replaced GFA Basic (one of the more popular Basics) with HiSoft Basic and Power Basic, both of which are Microsoft Basic compatible. HiSoft Basic is a Basic interpreter that allows full access the the GEM system and also gives a compiled output. Power Basic is more expensive and incorporates an editor, compiler and debugger.

For all of you out there that are strong GFA Basic supporters, the GFA line of software is not dead, only the marketing companies have changed. The line of products under the GFA banner will be receiving support from GFA Systemtechnik after they have established their offices in America (they are already distributing it in England).

IBM emulation

WHEN YOU BUY an Atari ST you are not necessarily limited to Atari ST software products. The Atari ST offers additional benefits through its unique emulation capabilities. With an outlay of an extra few hundred dollars (for the emulation software or hardware) you can make your ST think it's an IBM or a Macintosh.

PC Ditto software and PC-Ditto II Hardware (Avant-Garde Systems) IBM emulation may be the answer for those of you who bought an Atari ST for personal use, only to find that you need to take work home from the office, and consequently need to run some of the packages from the MS-DOS environment. The Atari ST drive can read and write to an IBM 3½ inch 720K disk directly, so no file conversions are necessary. And now that IBM are going over to 3½ inch disk format, the time consuming task of transferring programs and data from 5¼ inch to 3½ inch disks will disappear. All you will need to do is bring your work home, pop the disk into the Atari ST drive and away you go.

The future looks bright and diversified for this once maligned computer – it is finally coming of age.

There are two versions of PC-Ditto available. A software only version (PC-Ditto V3) which is very slow (30 per cent slower than what it is emulating), but it does give the Atari ST the power to imitate an IBM PC XT at a relatively low cost. No extra hardware is required, although a 5¼ inch disk drive would come in handy if your original IBM programs are on that size disk. It would save you the problem of porting them over to a 3½ inch disk. The second version is a new hardware-based emulator that plugs into the cartridge port and uses custom chips. PC-Ditto II gives XT compatibility and super Turbo XT performance. Programs running under PC-Ditto II emulation run three times the speed of the XT. So, if you are serious about running IBM programs on an Atari ST this would seem to be the logical solution.

PC-Ditto II features include up to 640K usable memory (machines with 1Mb memory or more), monochrome and colour graphics capabilities on all Atari monitors, fixed disk adapter with automatic access to all Atari partitions, Microsoft compatible mouse as well as standard mouse support, Atari clock/calendar date and time support, full serial and optional 5¼ inch 40-track drives. Both versions of PC-Ditto will continue to be sold and supported, as Avant-Garde Systems believe that each version caters for a different segment of the market.

If you need a 5¼ inch drive to hook onto your Atari ST, Atari Australia P/L are distributing the PCF554 5¼ inch disk drive with 40/80-track availability and a 13-pin connector for $399 specifically for PC-Ditto users.

Other add-ons

AMONG THE various other items you could spend your money on are Genlock devices. A version of Genlock has been developed in South Australia and should be

Hints, tips or ideas?

Got any hints, tips or ideas you'd like to share with other Atari users? Or maybe you've discovered (or written) a great new program you'd like to tell others about – if so, send them (on disk) to *Your Computer, PO Box 227, Waterloo 2015 NSW* and we'll pass them on to Rita Plukss for possible inclusion in the column. Please include a printout of the disk and caption any illustrations. Unfortunately, because of space limitations, we cannot publish listings over 200 lines long.

Macintosh emulations

MACINTOSH EMULATION is somewhat more involved than IBM emulation. All Macintosh emulation products come as a cartridge to be inserted into the Atari ST cartridge slot. The first hurdle to overcome is the installation of the Apple ROMs into these cartridges. The only packages that come with the ROMs already installed are Aladin and Spectre GCR. The next problem is the set-up time required before you can actually start using your Atari ST as a Macintosh. Both these problems can be easily overcome with a little time and patience.

A more pertinent problem is that you cannot, with most of the packages, use your original Macintosh disks in your Atari ST drive. You have to port the Macintosh program over to an Atari-format disk. But, this problem is being solved by a hardware device which is now available, appropriately named the Translator (from GCR), which enables you to read and write to a Macintosh formatted disk, but it is somewhat slow. The Translator will work with Magic Sac and Spectre, but not with Aladin. Another product, the Discovery Cartridge allows for the translation of Macintosh format to Atari format and vice versa for all three packages including Aladin.

If you find the above problems to be trivial and want to run Macintosh software on your Atari ST, there are pluses. By running Macintosh programs under Atari ST emulation you will have a larger screen display than the Macintosh itself (the Atari mono monitor screen being larger than the Macintosh screen), and the programs will run faster. The cost of an ST with Macintosh emulation is also quite a deal cheaper than a Macintosh. MAGIC SAC by David Small (Data Pacific) uses 64K Apple ROMs and was the first Macintosh emulator. The ALADIN cartridge, which was developed in Germany, has the 64K Apple ROMs installed.

Spectre 128 (by David Small of Gadgets by Small) is a Macintosh Plus emulator and uses 128K ROMs. Some dealers can supply these ROMs as an optional extra at the time of purchasing Spectre 128. Spectre 128 is compatible with Magic Sac, but Magic Sac is not compatible with Spectre 128. Spectre 128 GCR is an upgrade to Spectre 128 and has the ability to read and write Macintosh disks under emulation at least as fast as the Macintosh itself. With this product your Atari ST drive can read and write to a Macintosh disk directly without any need to change file formats. It is compatible the the Macintosh hard disk and removable media, which means the hard disk cartridges can be swapped between the Megafile 44 and the Macintosh removable 44Mb.

If you are serious about running Macintosh programs on your Atari ST I would suggest you spend some time investigating each of these products before deciding which one suits your needs. An important factor is the ability to read and write disks directly, or if your budget doesn't stretch that far, the problems of format transfers and set-up times.

There are rumours that the author of Revolver (Intersect software), Small (Macintosh emulation), and Teal (IBM emulation) are talking about operating Spectre 128 and PC Ditto as one package, giving Atari ST owners three computers in one, at the flick of a switch. It's a very interesting idea, but whether it will ever come to fruition is debatable since there seems to be some opposition from Atari Corporation (USA) itself. But then, that has never stopped these types of system buckers before!

Whatever happened to the interface box shown at the fall Comdex show (1988) that permitted a Mega ST to emulate an IBM 3270 terminal? The Tozd 3270 emulator box allowed up to eight computers to emulate IBM terminals which could be just the thing for engineering shops looking at low cost alternatives to what seems to be an IBM market stronghold.

available by the time you read this. This Australian version is said to be better than the overseas product, and you know it will work under Australian conditions. There are two models envisaged, one for the hobbyist and one for the commercial market, with prices to match.

Another new product is the Datashow 480 from Kodak (approximately $2000-$2500 plus sales tax). This allows the Atari ST mono screen (640 *x* 400) to be transferred to an overhead projection screen. An interface will be required ($200) and will be available from Austech Computers in Melbourne (03) 894 1652.

There are many more new and still-to-be-completed third-party hardware gadgets for the Atari ST. Most of them seem to be coming from Europe where the Atari ST has strong market dominance. The only trouble is that you cannot walk into any given dealer and see them. You have to do your own investigating to find what you are after, as the availability of these items is somewhat restricted in Australia. If you need a specific piece of hardware or software let your dealer know and insist that they find out the details for you.

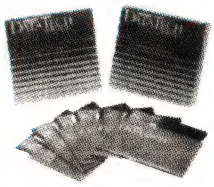
The future looks bright and diversified for this once maligned computer – it is finally coming of age. The rest of the world (including the manufacturing and business sectors) are coming to realise what we Atari owners have always known. Pricing and marketing do not the best computer make, unless you are looking to capture a gullible market. More importantly people are looking for inbuilt power and versatility at realistic prices. And that is what the Atari ST offers.

One of the neglected areas in the Atari scene has always been developmental support for all the lateral thinkers tinkering with their computers. These are the people that come up with the innovative ideas which should be strongly marketed (especially if the final product is a good one). But, as with all inventive thinkers, they are usually only really interested in new ideas and making them work. The thought of becoming embroiled in the marketing and business side of their 'product' leaves most of them cold. And unfortunately there has been little entrepreneurial skill floating around the Atari world. But all this is about to change (I hope). □

MICRO-EDUCATIONAL PTY LTD

Unit 8, 235 Darby St, Cooks Hill NSW 2300 Phone (049) 264122 Fax (049) 262194

DISKS



Wabash DataTech and Verbatim Datalife brand disks. Lifetime warranty. Over 4,000,000 sold a year.

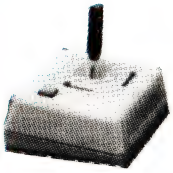
5.25" DSDD (Wabash)
10+ - **$1.00**
100+ - $0.90
400+ - $0.75

5.25" DSHD (Wabash)
10+ - **$3.50**
100+ - $3.20
400+ - $3.00

3.5" DSDD (Wabash)
10+ - **$2.75**
100+ - $2.60
400+ - $2.40

3.5" DSHD (Verbatim)
10+ - **$7.95**
100 + - $7.00
400 + - $6.50

APPLE/IBM JOYSTICK



Anko joystick. Highly durable. Suits Apple II+, IIe, IIc, IIGS and IBM. Features 2 fire buttons, self centring.

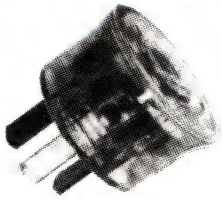
$46.00

COMMODORE JOYSTICK

Joystick for Commodore, Atari, Amiga, etc. Auto-firing mechanism. Great price!

$25.00

THE BUTTON



From Bowthorpe. Spike and surge filter. Protect against lightning strikes. $35 is a small price to protect your valuable equipment.

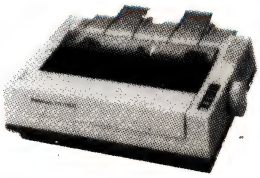
$35.00

WESTINGHOUSE SPIKE FILTERS

More substantial than the Button. Filters out current fluctuations. 3Amp version suitable for most single unit installations.

3Amp - **$145.00**
6Amp - **$155.00**
10Amp - **$165.00**

PANASONIC KX-P1081 PRINTER



A 144cps dot-matrix printer. Also prints 28cps in NLQ. Tractor feed, friction feed as standard. Switch selectable print mode selector. Budget priced. Epson and IBM compatible. 12 month warranty.

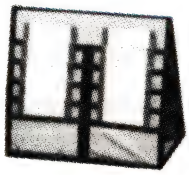
$399.00

DISK FILES

Quality disk files made from high-impact plastic. Keep your disks safe from dust.

DD100(100 x 5.25") - **$25.00**
SWS60 (60 x 5.25") - **$20.00**
DD80L (80 x 3.5") - **$30.00**
DD40L (40 x 3.5") - **$20.00**
DD10L (10 x 5.25") - **$3.00**
DD10A (10 x 3.5") - **$3.00**

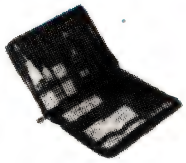
SOFT DISK CASE



Soft disk carry cases for 3.5" and 3" disks. Anti-static and X'Ray shielded.

10 capacity - **$20.00**
20 capacity - **$30.00**

TOOL/ CLEANING KIT

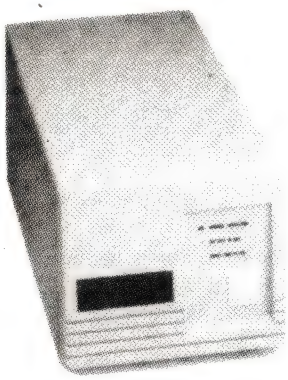


Contains all the tools you need for the care and maintenance of your computer. Screwdrivers, mini vacuum cleaner, disk cleaning kit, antistatic wipes, etc.

$95.00

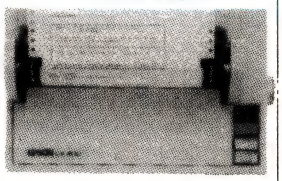
UNINTERRUPTABLE POWER SUPPLY

A battery-backed uninterruptable standby power supply from Primax. Provides continuous protection against line noise, transients, surges, spikes, brownouts, etc. Battery will cut in if power fluctuates more than ± 10%. Powerful enough to power two IBM XT's with hard disks and two monitors (one colour, one mono). Both an audible and visual alarm is provided when power drops. Audible alarm may be disabled if required. Protect your investment in computer equipment and time, by purchasing a UPS today! Only limited stocks available at this price.



ONLY $699

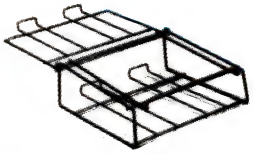
EPSON LX-800 PRINTER



From the world's leading manufacturer of printers. Fast, highly reliable, IBM compatible. Top speed 180cps in draft, 24cps in NLQ.

$525.00

WIRE PRINTER STANDS



Sturdy wire printer stands with output tray for collection of paper. Paper may be stored underneath.

10" version **$35.00**
15" version **$45.00**

PERSPEX PRINTER STANDS

An Australian made and designed printer stand. Holds 500 to 1000 sheets of paper underneath. A very popular item.

10" version **$35.00**
15" version **$45.00**

PHONE (049) 26 4122

MICRO-EDUCATIONAL PTY LTD

Unit 8, 235 Darby St, Cooks Hill NSW 2300 Phone (049) 264122 Fax (049) 262194

MAESTRO 2400 ZXR MODEM

Our top selling modem. Supports 300, 1200, 1200/75 and 2400 baud. Auto-answer, auto-dial, disconnect. Hayes AT compatible. Over 14,000 sold. Telecom approved.

$399.00

MAESTRO 2400 XR MODEM

Similar to ZXR, but doesn't support 300 and 1200/75 baud rates.

$369.00

MAESTRO v.32 SUPER EXECUTIVE

Again Maestro have broken the price barrier, with the release of a 9600 baud modem for under $2000. Way under. Also supports 300, 1200, 1200/75 and 2400 baud. Absolute latest in technology.

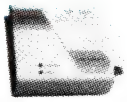
$1500.00

MAESTRO 2400 DATA OPTIMIZER

A MNP Mode 5 data compression, 2400, 1200 baud modem. Auto everything with error correction. Capable of quadrupling the data flow, depending on the file, transmission can reach 9600bps - error free.

$499.00

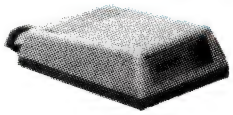
SERIAL/PARALLEL CONVERTERS



These devices do what the name says. Converts parallel signals to serial and vice versa.

Parallel to Serial **$120.00**
Serial to Parallel **$120.00**

ANKO APPLE MOUSE



Mouse for Apple IIc, Mac 512, and Mac Plus. 200 DPI resolution. One button. Cheaper than Apple equivalent.

$69.00

LOGITECH MOUSE

For IBM PCs and compatibles. Fully Microsoft compatible. Includes full suite of driver software.

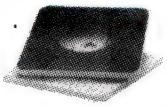
Serial version **$199**
Bus version **$249**

MONITOR MOVER

A monitor arm, allows full 360° rotation of monitor. Keyboard tray.

$199.00

MONITOR SWIVEL



A desk based monitor swivel. Allows tilting of monitor.

$35.00

CABLES

We stock a range of cables, most for $30. Please call if your requirment isn't listed.

2m male-male serial **$30**
2m male-female serial **$30**
2m IBM Printer cable **$30**
2m IBM AT serial cab **$30**
2m male-male centron **$30**

T-SWITCHES

You can share peripherals between various computers.

TSW2P
One parallel to two **$60**
TSW4P
Four parallel to one **$120**
TSW2XP
Two parallel to two **$120**
TSW2S
Two serial to one **$55**
TSW4S
Four serial to one **$110**
TSW2XS
Two serial to two **$110**
POCKETP: Pocket sized one parallel to two **$100**
POCKETS: Pocket sized one serial to two **$90**

MOUSE MAT

Micro-Educational mouse mat. Made from neoprene. Protect your desk from scratches.

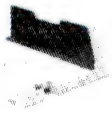
$15.00

MOUSE HOLDER

Attach your mouse safely on the side of your monitor, computer or desk.

$9.95

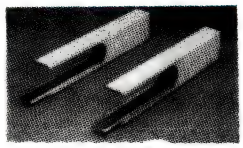
CPU STAND



Vertical CPU stand. Suitable for IBMs and similar. Adjustable size.

$30.00

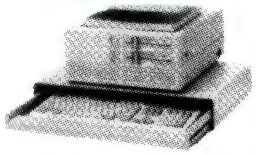
KEYBOARD SLIDEAWAY



You can now fit any keyboard, wide or narrow, under your desk.

$50.00

KEYBOARD DRAWER



Stores keyboard under your monitor or computer, freeing up valuable desk space, and keeping your keyboard safe from damage, spillage, etc.

$70.00

COPY HOLDER

Complete with detachable line guide. Suitable for A4 sheets and smaller. Desktop based.

$25.00

SOFT EYES SCREEN FILTERS

Protect your eyes from screen glare and reflections. Made from carbon mesh fibre.

12" monochrome **$35**
12" colour **$40**
14" monochrome **$45**
14" colour **$50**

MAIL ORDER FORM

Dear George,
Please send me the following: _____

_____

_____

_____

By Post ❑ (min. $4), or Courier ❑ (min. $10)

Enclosed please find Cheque/Money Order/Bankcard/Mastercard/Visa no.

_____

Expiry date: ____ / ____

Name: _____

Address: _____

_____

Phone: _____

Postage Rates: Allow the above rates for orders up to 5Kg. Rates increase after this. If unsure, please ring us.

TIM HARTNELL

Keeping posted

IN THE COLUMN this month, we'll be looking at programs to create 'posters' on the CPC and PC machines, and patterns on the PC, as well as turning to your expertise to solve some problems other users have experienced with certain Basic2 commands.

FLOOD and TEST

RODNEY JANETZKI, of 7 Dimboola Road, Nhill, 3418, has written a superb graphics drawing program, designed to run under Basic2 v1.0 or higher. It contains full instructions and supports a large number of commands. If you send Rodney a formatted disk, along with $1.00 for return postage, he'll send you a copy.

Rodney says he needs help with two commands in Basic2. The first of these is the 'TEXT(x;y)' command, which gives a result of 2, no matter what the actual colour at that location is. The 'FLOOD x;y,limit' command does not seem to work at all in v1.0 of Basic2. If you have any hints on how to use these commands successfully, please let me know (along with the version of Basic2 you're using).

Pat Clark, from Gilles Plains in South Australia, wants to know if the Snapshot command in Gem Paint can be made to work on a full screen. 'It comes up with a message about not enough memory. I have a hard drive so perhaps it refers to the RAM,' Pat writes. 'Also, if I try to take a snap of one of a plotted pattern, the screen blanks and just a ghost of the pattern returns, and this 'ghost' is what is snapped.' Please let me know if you can help Pat with this problem.

```
REM Galaxy for PC
CLOSE #2:CLOSE WINDOW 3:CLOSE WINDOW 4
WINDOW #1 FULL ON
SCREEN #1 GRAPHICS
OPTION DEGREES
BOX 0;0,8400,5000
REM For colour version, above line ends
    FILL COLOUR 5
PRINT :SET MODE 2
REM For colour version reads SET COLOUR
    12 MODE 2
PRINT TAB(32) "Enter stepsize"
PRINT TAB(28) "Suggested between 50-200"
PRINT:PRINT TAB(28);:INPUT s
PRINT
PRINT TAB(31) "Enter values A,B,"
PRINT TAB(25) "Minimum 0.0005 to maximum
    40.0"
PRINT:PRINT TAB(28);:INPUT a,b
CLS
BOX 0;0,8400,5000
REM For colour version, above line ends
    FILL COLOUR 3
USER ORIGIN 4000;2500
LOCATE 25;10
FOR ang=0 TO 36000 STEP s
x=ang*(COS(a*ang)):y=ang*(SIN(b*ang))
CIRCLE x/10,y/15
NEXT ang
LOCATE 27;20:SET MODE 2
REM For colour version line ends SET
    COLOUR 2 MODE 2
PRINT "Press any key for a rerun"
WHILE INKEY$="":WEND
RUN
```

Listing 1. Back in July 1988 we originally published this program called Spiral Galaxies by Jeff Hughes for the 464/1628 machines. L. Vandenberg of Kilkenny in South Australia has modified it to run on the PC1512, in colour. 'To see these galaxies running in colour is absolutely stunning, and can only be described in one word: Wow!' he wrote. He suggests you try these combinations: Step 100, A 3.0, B 3.0 which gives 'Oyster Shells'; 120, 1.0, 0.5 (Balloon on a String); 50, 20.0, 0.0005 (Trumpets).

Modifying Basic programs

J R WILSON, of Oxley in Queensland, says it took him the best part of a day to discover why he had been unable to modify any of his Basic programs written in GWBasic or BasicA using the word processing program WordPerfect.

'I discovered that in order to be edited, programs have to be saved in ASCII format, using the command SAVE 'Myfile.bas',A. It is that last 'A' on the end of the SAVE command that makes all the difference. If the 'A' is not used, then the files are written to disk in a way in which the word processor cannot read in normal alphabetical characters.

'The program must also be read into WordPerfect as an ASCII file. This is done by pressing Ctrl/F5 to get the menu of options, and then pressing 2 to read the file into WordPerfect as a DOS text file. Similarly, the file must be saved in the same format, using Ctrl/F5 and then pressing 1.

Although it is not necessary to save Basic2 files using the ,A at the end of the SAVE command, you will still need to use the DOS text in and DOS text out functions with WordPerfect. If you don't, Basic2 refuses to load the program after it has been edited.

Creating a sign

THIS MONTH'S main program allows you to enter a message of up to 255 characters, on either the CPC or PC Amstrad computers, and to print out a message sideways on your printer, in characters which are eight times the size of the original characters. The A is made up of little capital As and so on. The program recognises the letters of the alphabet, the full stop, the exclamation mark and a space.

I wrote the program after referring to the reference section in the back of one of my Amstrad manuals, which showed how the characters were built up on an eight by eight grid. It simply uses LPRINT and strings to print up the required letter. Once you have the program running, you

```
10 REM Billboard
20 REM BILLBOAR.D
30 REM All input must be in upper case
40 CLS
50 INPUT "Enter your message     ",A$
60 B = LEN (A$)
70 FOR C = 1 TO B
80 D = ASC(MID$(A$,C)) - 64
90 IF D = -18 THEN GOSUB 420:GOTO 140:REM Period (.)
100 IF D = -31 THEN GOSUB 430:GOTO 140:REM Exclamation mark (!)
110 IF D = -32 THEN GOSUB 440:GOTO 140:REM Space
120 IF D < 1 OR D > 26 THEN GOSUB 440:GOTO 140:REM UNKNOWN CHARACTER
130 ON D GOSUB 160,170,180,190,200,210,220,230,240,250,260,270,280,290,300,310,320,330,340,350,
     360,370,380,390,400,410
140 LPRINT:NEXT C
150 END
160 LPRINT "AAAAA":LPRINT "   A A":LPRINT "   A  A":LPRINT "   A A":LPRINT "AAAAA":RETURN
170 LPRINT "BBBBBBB":LPRINT "B  B  B":LPRINT "B  B  B":LPRINT "B  B  B":LPRINT " BB BB":RETURN
180 LPRINT " CCCCC ":LPRINT "C    C":LPRINT "C    C":LPRINT "C    C":LPRINT " C   C":RETURN
190 LPRINT "DDDDDDD":LPRINT "D    D":LPRINT "D    D":LPRINT "D    D":LPRINT " DDDDD":RETURN
200 LPRINT "EEEEEEE":LPRINT "E  E  E":LPRINT "E  E  E":LPRINT "E    E":LPRINT "E":RETURN
210 LPRINT "FFFFFFF":LPRINT "   F  F":LPRINT "   F  F":LPRINT "   F  F":LPRINT "      F":RETURN
220 LPRINT " GGGGG":LPRINT "G    G":LPRINT "G    G":LPRINT "G G  G":LPRINT " GG  G":RETURN
230 LPRINT "HHHHHHH":LPRINT "   H":LPRINT "   H":LPRINT "   H":LPRINT "HHHHHHH":RETURN
240 LPRINT:LPRINT "I    I":LPRINT "IIIIIII":LPRINT "I    I":LPRINT:RETURN
250 LPRINT :LPRINT "JJJ":LPRINT "J    J":LPRINT "J    J":LPRINT " JJJJJJ":RETURN
260 LPRINT "KKKKKKK":LPRINT "   K":LPRINT "  K K":LPRINT " K   K":LPRINT "K    K":RETURN
270 LPRINT "LLLLLLL":FOR Z = 1 TO 4:LPRINT "L":NEXT Z:RETURN
280 LPRINT "MMMMMMM":LPRINT "    M":LPRINT "   MM":LPRINT "    M":LPRINT "MMMMMMM":RETURN
290 LPRINT "NNNNNNN":LPRINT "    N":LPRINT "   NN":LPRINT " NN":LPRINT "NNNNNNN":RETURN
300 LPRINT " OOOOO":LPRINT "O    O":LPRINT "O    O":LPRINT "O    O":LPRINT " OOOOO":RETURN
310 LPRINT "PPPPPP":LPRINT "   P  P":LPRINT "   P  P":LPRINT "   P  P":LPRINT "    PP":RETURN
320 LPRINT " QQQQQ":LPRINT "Q    Q":LPRINT "Q Q  Q":LPRINT "QQ   Q":LPRINT " QQQQQ":RETURN
330 LPRINT "RRRRRR":LPRINT "   R  R":LPRINT "  RR  R":LPRINT " R R  R":LPRINT "R   RR":RETURN
340 LPRINT " S  SS":LPRINT "S  S  S":LPRINT "S  S  S":LPRINT "S  S  S":LPRINT " SS  S":RETURN
350 LPRINT "      T":LPRINT "      T":LPRINT "TTTTTTT":LPRINT "      T":LPRINT "      T":RETURN
360 LPRINT " UUUUUU":LPRINT "U    U":LPRINT "U    U":LPRINT "U    U":LPRINT " UUUUUU":RETURN
370 LPRINT "   VVVV":LPRINT " VV":LPRINT "V    V":LPRINT " VV":LPRINT "   VVVV":RETURN
380 LPRINT " WWWWWW":LPRINT "W    W":LPRINT "WWWWW":LPRINT "W    W":LPRINT " WWWWWW":RETURN
390 LPRINT "X    X":LPRINT " XX XX":LPRINT "   X":LPRINT " XX XX":LPRINT "X    X":RETURN
400 LPRINT "    YY":LPRINT "    Y":LPRINT "YYYY":LPRINT "    Y":LPRINT "    YY":RETURN
410 LPRINT "ZZ   Z":LPRINT "Z Z  Z":LPRINT "Z  Z  Z":LPRINT "Z  Z Z":LPRINT "Z   ZZ":RETURN
420 LPRINT "@@":LPRINT "@@":LPRINT:LPRINT:LPRINT:RETURN
430 LPRINT "@@ @@@@":LPRINT "@@ @@@@":LPRINT:LPRINT:LPRINT:RETURN
440 LPRINT:LPRINT:RETURN
```

Listing 2. Billboard lets you to enter a message of up to 255 characters, on either the CPC or PC Amstrad computers and then print it out as a message sideways, in characters which are eight times the size of the original characters.

can easily modify any of the letters you wish to change.

The output runs along the top side of the paper, and you can then cut up the strip of printout and paste it up into a poster or sign. Photocopy the pasted up version produces a good final result.

We'll be including Your Amstrad in future issues of the magazine. I'd be interested in hearing from any companies making or importing software and/or hardware for any of the Amstrad computers.

It's a miracle!

We've now got Microbee!

FREE

SOFTWARE!

IBM PC
Apple II
Mac
Microbee

DETAILS IN OUR ***NEW*** CATALOGUE of cut-price & **FREE SOFTWARE**

For *your* copy, ring **(03) 648 1191** at *any* time, and be ready to tell our receptionist your name, address and make of computer.

Or write: Tim Hartnell, Interface Publications (Aust.) Pty. Ltd., Room Y4, 34 Camp St., Chelsea, Vic., 3196

Installing a hard disk

ROBERT ROY of Woombye in Queensland has just updated his PC1640 from dual floppies to a Kyogora 3½ inch 20Mb hard disk, with a Western Digital controller. This allows him to use the Amstrad-supplied hard disk files Park.com and HDFormat on disk 4. The install program for the PC installs all four disks supplied onto the hard disk, except for the system files for MS-DOS. Robert has discovered that if you have a hard disk, and the RAM disk is set for use, GEM will automatically reset the value in the non-volatile RAM for this disk to zero, which is effective at the next reboot. We'd welcome any other comments or hints.

```
10 REM BUILD A SOLAR SYSTEM
20 REM SOLAR.BAS
30 REM *****************
40 KEY OFF:CLS
50 INPUT "ENTER WIDTH OF THE SOLAR
   SYSTEM (IN METRES)";MT
60 MT=1000*MT
70 REM *****************
80 CLS
90 PRINT "PLANET";TAB(11);"CENTRE (M.)";
   TAB(24);"DIAMETER (CM.)":PRINT
100 FOR J=1 TO 9
110 READ N$,CEN,DIA
120 CEN=INT(.05+MT*CEN)/1000
130 DIA=INT(1E+07*MT*DIA)/1E+07
140 PRINT N$;TAB(11);
150 IF CEN<1 THEN PRINT " ";
160 IF CEN<10 THEN PRINT " ";
170 PRINT CEN;TAB(23);DIA
180 NEXT J
190 END
200 REM *****************
210 DATA "MERCURY",9.795705E-03,8.234413E-08
220 DATA "VENUS",1.830246E-02,2.048793E-07
230 DATA "EARTH",2.530543E-02,2.157728E-07
240 DATA "MARS",3.855695E-02,1.148048E-07
250 DATA "JUPITER",.1316576,2.146026E-06
260 DATA "SATURN",.2418885,2.018514E-06
270 DATA "URANUS",.4853991,8.59302E-07
280 DATA "NEPTUNE",.7606177,8.220881E-07
290 DATA "PLUTO",.9999992,4.905464E-08
```

Listing 1. *Here's a program for the CPC models or PCs running GWBasic which gives you the required dimensions for building a model solar system. If you were making a model of the solar system to scale, and you decided to have a tennis ball for the earth, the sun on the same scale would demand a whopping great beach ball more than eight metres in diameter. To simplify your life as a builder of model solar systems, the program asks you to enter the size of the container, room or universe you want your solar system to fit within. Just enter the width of your solar system in metres.*

Re-inking, episode II

ANTHONY TROST from Gracemere in Queensland has written to us regarding the tip passed on in an earlier column by Allan Barry regarding re-inking the DMP 2000 ribbons. Anthony reckons that Allan is re-inking the hard way. He comments: 'Dribbling the ink directly onto the ribbon is a recipe for a messy disaster for the first time re-inker.'

How else can it be done? Anthony thinks he has worked out a foolproof method. 'Looking at the printer from the front, the ribbon winds in and around a plastic case at the right. This case can be prised open with a small razor blade. Its assembly works the same way as the little toys given away in cereal packets where you are told to press out the parts and snap them together.

'Inside this plastic case is a small felt roller about the same size as a $1 coin. By dribbling ink onto this roller once a month, all the ink is instantly absorbed and is slowly fed out to the ribbon. This causes little mess during, and after, the re-inking process. 'The trouble comes when you've let the ribbon go for too long. The temptation to give the roller a really good double dose to get an instant improvement only leads to an instantly messy result on your hands, the printer and the paper. Instead of doing this, give the roller a normal amount of ink, and let time and printer use do the rest.'

Anthony says he's been dealing with the firm Aussoft for more than a year, 'and a nicer, more professional outfit would be harder to find.' Aussoft put Anthony onto a product called the 2000BS ribbon, which is a 30cm loop replacement for the 2000 and 3000 series machines. Anthony has found that the 2000BS fits well into place, and appears to be of better quality, and thicker than the Amstrad ribbon, and therefore a much better candidate.

The portable Amstrad

PHIL SPENCER from North Rockhampton, who recently bought the portable PPC640 machine, says the original AUTOEXEC.BAT supplied on the system disk calls the file LCD.COM to set up the 'hot keys' which change the display set up. LCD also gives you the message about the key assignments.

You can, however, use the command directly with some options to modify the basic setup:

- LCD – use this to set up and display the 'hot keys' to alter the LCDisplay settings
- LCD /C – sets the video screen more
- LCD /L – sets the LCD mode
- LCD /N – sets the normal LCD 'colour' contrasy
- LCD /I – sets the alternative LCD 'colour' contrast

Phil points out that if you are not using an external monitor, you can remove the call to LCD from the AUTOEXEC.BAT file, but cautions that the AUTOEXEC file should only be changed if you really know what you're doing. Make sure you make a backup of it under another name, before introducing any changes.

```
REM BUILD A SOLAR SYSTEM
REM SOLAR2.BAS
REM *****************
CLS
INPUT "ENTER WIDTH OF SYSTEM (IN METRES)";mt
mt=1000*mt
REM *****************
CLS
PRINT "PLANET";TAB(11);"CENTRE (M.)";TAB(24);
      "DIAMETER (CM.)":PRINT
FOR j=1 TO 9
 READ n$,cen,dia
 cen=INT(.05+mt*cen)/1000
 dia=INT(1E+07*mt*dia)/1E+07
 PRINT n$;TAB(11);
 IF cen<1 THEN PRINT " ";
 IF cen<10 THEN PRINT " ";
 PRINT cen;TAB(23);dia
NEXT j
END
REM *****************
DATA "MERCURY",9.795705E-03,8.234413E-08
DATA "VENUS",1.830246E-02,2.048793E-07
DATA "EARTH",2.530543E-02,2.157728E-07
DATA "MARS",3.855695E-02,1.148048E-07
DATA "JUPITER",.1316576,2.146026E-06
DATA "SATURN",.2418885,2.018514E-06
DATA "URANUS",.4853991,8.59302E-07
DATA "NEPTUNE",.7606177,8.220881E-07
DATA "PLUTO",.9999992,4.905464E-08
```

Listing 2. *The solar system building program for PCs running Basic2.*

Saving RAM-drive space

IN THE MARCH issue of YC, Bob Abel from Condobolin, NSW, explained how he reconfigured his system to load GWBasic and his book-keeping menu onto his RAM-drive. Bob added the comment that this could be done, 'so long as its size permits it to co-exist.' After thinking about Bob's problem, Pat Herley from South Clayton in Victoria, thinks he has come up with a solution. 'It occurs to me that the easiest way to save the 85K of space which GWBasic takes,' writes Pat, 'is to include the RAM drive in the AUTOEXEC.BAT path statement, and call for files when in GWBasic with the load command, plus a full path statement.' As Pat points out, with this you've picked up 85K, which on a 128K RAM-drive is a very significant amount.

Help!

MARK THOMAS, from Port Lincoln in South Australia, says he has been impressed with the range of expertise which readers of this column have demonstrated when assisting other Amstrad users with their problems. And he has a really curly one, which he hopes we can solve. Get your thinking caps on and help Mark, plus the many other people who are probably sharing his dilemma.

Mark is running GEM Desktop 2.1 on his 1640. 'I have just purchased GEM Desktop Publisher 2.0, which comes with (and needs) GEM Desktop 3.0. What you are supposed to do is delete the un-needed GEM 2.1 files, install 3.0, and all should be sweet.' But Mark discovered (as I have in my own forays around the Desktop) that life with GEM was not meant to be easy. 'Gem Paint and Basic2 do not recognise the fonts of GEM 3.0 properly, and I have had to re-install GEM 2.1 and start up from there, if I want a reasonable range of fonts. I really don't want to run two GEM Desktops if I can avoid it.

'The strange part of this is that Basic2 and Paint, when loaded from within GEM 3.0, recognise that I do have new Swiss and Bitstream Charter fonts, but they get the sizes all screwed up. I have installed the 7, 10, 12, 14, 18, 25 and 50pt fonts in those two styles, but Basic2 and Paint reckon that I have – wait for it – 24, 25, 26, 36, 50 and 100pt fonts in those styles, and only 8, 10, 16 and 20pt sizes in System. I might add that the ones that match what I installed, such as 25 and 50pt Swiss and BSC work fine, but the rest are low quality. And where did the sizes below 24 go?

'The GEM 3.0 manuals do not refer to any such problems, and no-one else seems to know, so I thought I would draw on the collective wisdom of other YC readers. My understanding of the workings of GEM is that it loads the information pertaining to the available fonts when the GEMVDI and GEM programs load, and then passes this information onto the programs. If so, how can GEM Desktop Publisher know about my fonts, but not Paint and Basic2?'

If you can solve this problem, or have any ideas on how it might be solved, please let us know, so we can share the solution. Mark's problem reminds me of a recurrent one I have which I think is beyond solution, and I just live with. From time to time Output from Paint just doesn't work and hangs the system. The only way to get it to work that particular day, and there seems to be no consistent solution from day to day, is to reboot using a different copy of the Desktop. Generally, if one Desktop doesn't allow Output to work, another copy of it will. I put that down to a random little GEM person who runs around the system causing minor havoc. If you have a more realistic solution, please let me know. It is a real pain – as you know – going through all the hassle of starting again with Desktop on a twin floppy system.

Using GEM on a hard disk

EVAN BOTTCHER from Cohuna in Victoria has supplied us with a very valuable tip concerning the use of GEM software on an Amstrad PC with a hard disk. To install GEM on the hard disk, you proceed as follows:

First make these six subdirectories –

IMAGES – containing PC1512.GEN, PC1512.IMG, TIGER.GEM and TIGER.IMG,

GEMBOOT – containing SNAPSHOT, SNAPSHOT.RSC, CALCLOCK.ACC, GEM-.EXE and GEM.RSC,

GEMSYS – containing OUTPUT.APP, DEFAULT.OPT, OUTPUT.RSC, METAFIL6.RSC, GEMVDI.EXE, AMSTRAD.SYS and ASSIGN.SYS; this subdirectory also contains your fonts and printer drivers,

GEMDESK – containing DESKTOP.APP, DESKLO.ICN, DESKTOP.INF and DESKTOP.RSC,

BASIC2 – containing BASIC2.APP, BASIC2.RSC, and whichever other BASIC programs you wish to include; and

GEMAPPS – containing PAINT.APP and PAINT.RSC.

Once you have done this, you have to write a batch file which will load GEM automatically. This file should be in your root directory, or one of your paths, so that you can load it automatically from anywhere. Here's how its down from the command line –

```
COPY CON GEM.BAT
ECHO OFF
MOUSE
PATH C:\;C:\SYSFILES;C:\BASIC2
CLS
CD\GEMSYS
GEMVDI %1 %2 %3
[F6] or [Ctrl] [Z]
```

Then press the ENTER key.

This batch file assumes you have a directory call SYSFILES in which you have all of the MS-DOS commands. If you don't have this, then change that part of the file to suit your needs. With all this in place, you can go to the Desktop simply by typing GEM. You can also run a GEM application directly, just by typing in, for example, GEM PAINT.

INTERESTED IN COMPUTERS?

Right now we have quite a number of vacancies for staff throughout Australia.

We need:

Sales staff - ambitious self-motivated people who are interested in a retail career.
Applicants should possess an indepth knowledge of personal computers, peripherals and related software.

We offer:

- Security (our company is 21 years old)
- Job satisfaction (many interesting products in the computer range)
- Opportunity for advancement
- An attractive salary package
- Generous staff discounts
- Commission scheme
- Comprehensive training

Give us a call!

Sydney: R.McGuinness (02) 642 8784
Perth: P.Evans (09) 227 8243
Melbourne: A. McEwin (03) 428 0141
Brisbane: N.Wickson (07) 391 6490
Adelaide: M.Perry (08) 347 2075

DICK SMITH ELECTRONICS

IAN ALLEN

Reconcilable differences?

SEVERAL MONTHS AGO I did something I thought I'd never do. I went out and bought myself an IBM compatible. Now don't get me wrong, I'm not parting with my trusty C-128, it's just that I needed a computer I could carry to work and back. I also needed something I could carry with one hand, because when I'm in going-to-work mode my other hand is usually carrying a briefcase. For this the 128D just won't do, despite the fact that it's a very luggable computer. It's keyboard, drive, power supply and system box all fit together in one package with a neat carrying handle, but you also need to take a monitor, and that means two hands for one computer.

Maybe I'm too pragmatic, but my attitude is that the computers on the market tomorrow are always going to be cheaper or more powerful than the ones available today, so the only practical approach is to look for the machine which best meets your present requirements. Why second-guess your needs in two years time when by then there will be highly likely be better solutions available anyway. Stick to the present – at least you know it's real.

This attitude has paid off in the past. I purchased my first computer, a C-64, in 1983. Everybody said the Apple II was more expandable, but it was also more than twice the price. When I did finally decide I needed to expand to an 80-column screen and a faster disk drive I bought the 128D. Total cost of both machines was still less than if I had bought that original, expandable Apple II (even allowing for inflation).

And so my latest purchase came to be an Amstrad PPC512, the cheapest machine I could find that seemed to fit all of my requirements. An extremely portable 16-bit 8MHz computer with a shoulder slung carry case, in-built 80-column LCD screen, 512K of Ram, a disk drive plus 'productivity' software and an external amber monitor thrown in for the $999 I paid for it.

Owning both a C-128 and and MS-Dos machine makes for some interesting comparisons. The surprising thing is that the 128 stacks-up remarkably well. MS-Dos machines might offer a powerful processor and what seems like massive massive memory, but in practical terms most of that potential is simply not realised.

Take the disk drives. The Amstrad's 3½ inch drive provides 720K of storage.

I went out and bought myself an IBM compatible.

That's twice the capacity of the 1571 on the 128D and it's very much faster. You can backup an entire disk in just a couple of minutes, even with the disk swaps necessary for a single drive. The speed is wonderful, but the disk capacity is not what it seems. The problem is that MS-Dos software appears to take up an enormous amount of space. I don't know why this should be so, but I suspect that it's because MS-Dos software developers tend to write in a complied and portable language like C rather than in assembly language. On the system disk that came with the Amstrad there was just 35K of free capacity. The rest of the space was taken up by MS-Dos itself and a simple program called the PPC organiser which didn't strike me as anything to write home about.

All I wanted to do with my portable was word processing. I wanted to be able to write-up notes and then upload them via a direct connection to the office computer for printout. The office uses a Digital Decmate running WPS (Word Processing System). The Decmate manuals give minimal hardware information, but as far as I can tell it is an 8-bit machine with around 500K drives. I knew an IBM version of the software existed so in theory it should be an easy matter to run the same program on my machine. Not so. The computer people at work tell me the IBM version of WPS will not fit into a 512K machine with 'only' 720K of disk capacity!

The best word processor I could find was Microsoft Works. It fits on half a disk and it's fast. I suspect it's written in machine language – a welcome exception to the rule. It's by no means an ideal solution, but it's quite usable and a sort of cross between Superscript and Vizawrite. It also offers a simple spreadsheet and database, plus a telecommunications option. At $250 it stands out as good value in the MS-Dos world.

I guess what I'm saying is we should count our blessings. In terms of quality, 64/128 software stacks up surprisingly well against it's generic opposition in the 16-bit camp. When you compare Bobsterm 128 to the common MS-Dos equivalent 'Telix', you find that Bobsterm is about one quarter the size and matches Telix almost feature for feature in the functions you use the most.

It seems to me that the MS-Dos world relies on brute power rather than elegant software code. You really need a 20Mb hard disk if you are to get the most out of it. I guess it's only a question of approach and with the hardware becoming so inexpensive there's a lot to be said for brute power. The 64/128 camp represents the opposite extreme. The computers may be underpowered but the software is highly efficient.

If Commodore had been selling the 128D at it's present price of $499 when I was looking for a work computer, I would have gone for it. That way I could have left the second machine at work and only had to carry the disks home instead of the whole computer. We live and learn. □

APOGEE TECHNOLOGY

GENIUS DYNA MOUSE GM-6000

DYNAMIC RESOLUTION: 350-1050 DPI
PLUGS INTO SERIAL PORT
COMES COMPLETE WITH
Dr. GENIUS SOFTWARE
GENIUS MENU MAKER
MOUSE POCKET
MOUSE PAD

$109.00

INTEL MATH CO-PROCESSING

8087-1	$389.00
80287-10	$449.00
80387DX-16	$970.00
80387DX-20	$999.00
80387DX-25	$1290.00
80387DX-33	$1490.00
80387SX	$875.00

SPECIAL! LIMITED STOCKS AT THIS PRICE!
VERBATIM 3.5″ DSHD DISKS 10 PACK
$45.00

APOGEE BRAND DISK — 10 PACK
LIFETIME WARRANTY

5.25″ DSDD	$15.50
5.25″ DSHD	$29.50

VIDEO CARDS

MGA CARD	$95.00
CGA CARD	$98.00
EGA CARD	$299.00
VGA CARD	$499.00

HARDDISK

20MB SEAGATE	$349.00
30MB SEAGATE RLL	$409.00
40MB SEAGATE 40MS	$679.00
40MB SEAGATE 2EMS	$779.00
40MB CDC V/COIL	$849.00
WREN III 182MB ESDI	$2499.00

AT EDSI CNTRL HD+FDC	$719.00
ST11R RLL CARD XT	$98.00
ST11M MFM CARD XT	$98.00

COMPUTER PARTS

XT 10MHz M/BRD OK	$179.00
XT 10MHz M/BRD 640K	$479.00
AT 10MHz M/BRD OK	$459.00
AT 10MHz M/BRD 1MB	$969.00
150W XT POWER SUPPLY	$105.00
200W AT POWER SUPPLY	$179.00
101 KEY KEYBOARDS	$105.00

DRAM

4164-120NS	EACH	$4.55
4464-120NS	EACH	$17.80
4464-100NS	EACH	$19.00
41256-120NS	EACH	$13.95
41256-100NS	EACH	$14.25
41256-70NS	EACH	$19.00

PUBLIC DOMAIN SOFTWARE

OMEGA 3-D CHESS	$4.70
ARTIC FOX	$4.70
BASIC GAMES 1	$4.70
EGA TREK	$4.70

ALL ON 5.25″ 360K F/DISK

BUSINESS SOFTWARE

PFS: FIRST CHOICE V3	$189.00
DBASE IV 5.25″	$979.00
DBASE IV 3.25″	$979.00
RAPIDFILE 5.25″	$389.00
LOTUS 123+ALLWAYS	$689.00
1st PUBLISHER V2	$179.00
XTREEPRO	$195.00
CROSSTALK	$229.00

OTHER SOFTWARE

AIRBORNE RANGER	$48.00
GALACTIC CONQUEROR	$48.00
GUNSHIP	$57.50
IMPOSSIBLE MISSION II	$36.00
ULTIMA IV	$39.00
ULTIMA V	$57.50

XT 10MHz COMPUTER	$875.00
AT 10 MHz COMPUTER	$1549.00
AT 16MHz COMPUTER	$1900.00
MS DOS 4.0	$100.00
DRDOS 3.4	$99.00

ALL ABOVE ITEMS ARE FOR IBM AT AND XT OR COMPATIBLE COMPUTERS

SOFTWARE AT DISCOUNT PRICES ALSO AVAILABLE FOR MACINTOSH, C64, ATARI ST, APPLE, AMSTRAD AND AMIGA.

WRITE OR FAX TODAY FOR YOUR FREE CATALOGUE. PLEASE STATE WHICH COMPUTER YOU HAVE.

Cheque/Money Order enclosed or
please debit my (please tick) ☐ Bankcard ☐ Visa Card ☐ Master Card
with the following amount: $ ☐☐☐☐☐ ¢ ☐☐ Expiry Date: ____/____/____
Card Number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Name _____
Address _____
_____ Postcode _____
Signature _____ Phone _____

DESCRIPTION	QTY	PRICE	TOTAL
		POSTAGE ADD	$5.00
		TOTAL	

APOGEE TECHNOLOGY PTY. LTD.
UNIT B/254 MILPERRA ROAD
MILPERRA, NSW. 2214
PHONE: (02) 792-2300
FAX: (02) 792-2304

RURAL RAM

JOHN BAILEY

Mapping the future

THE AUSTRALIAN Government has declared that the last decade of this century will be devoted to conservation of our natural resources. This will no doubt please the greenies, but the people who will do the job are unlikely to have the time or energy left for banner-waving.

So where and how do computers come in? There are obvious answers to this, such as in the collection and collation of enormous amounts of data from satellite surveys. The planning package being explored by the Western Australian Department of Agriculture has been christened Land Man (before Land Person is foisted upon us, let it be known that it is short for Land Management). The package is based on survey software from Intergraph which is able to operate on microstations (microcomputers linked to a big mini). The software and hardware combination is able to relate a map to the physical resources of the area represented by the map and vice versa.

The microstation software is expensive to buy – around $4000 per program plus the specialised hardware to print it out. It does run under MS-DOS, but likes a lot of memory and has a special key-plug which holds it on-line during advanced operations. Use of the software requires skilled operators and extensive data to adequately describe the area undergoing planning. The Stirling Land Conservation District was recently shown figures that put the cost of surveying and drawing a total farm plan at near $10,000 per average property. Officers from the Department of Agriculture consider that this will be recovered by better land utilisation and the environmental savings.

Current advice is that land should be managed according to the soil types and lie of the land. I don't believe computers were invented when that opinion was first advanced. The present high-tech approach is aimed at creating farm models that will provide a long-term plan which assesses the four resources: land, finance labour and materials. This assessment will be modified by risk factors based on extensive meteorological information.

The amount of information that will be collected and presented will be too much

NIK MILLARD/NEGATIVE IMAGE KORPORATION

The Western Australian Stirling Land Conservation District was recently shown figures that put the cost of surveying and drawing a total farm plan at near $10,000 per average property. Officers from the Department of Agriculture consider that this will be recovered by better land utilisation and the environmental savings that will ensue in later years.

for most of us. Officers of the Department are looking at ways of importing some of the data into farm budgeting spreadsheets. They hope to convert the maps into a form that will allow land managers to make small modifications such as add or delete fence-lines, gateways and other cultural features without the need to own the Intergraph original package although it will still be required to create the initial plan and to do any reassessment.

Lack of information

THE AGRICULTURAL mistakes of this country are by and large due to lack of information rather than lack of care and there is a great determination on the part of ordinary souls to reverse the trends. It will take longer than a lifetime or two and planning that far ahead does require computer-aided crystal balls. In the meantime it has to be paid for, and most of the money will have to be earned from the land under repair. I think that the cost of the software related to Land Man is too great at the individual farm level. A strategy is required that will allow the use of less expensive software at the farm and catchment area level for outlining soil types, fences and so on.

There are certainly cheaper planning, mapping or drawing packages available if all one needs is a map that can be rapidly changed. There are plenty of partial budget spreadsheets available and lots of data on which to base linear projections. The simplest planning tool is a map covered with clear plastic, a wax pencil and a calculator. This works well for a time but I found that after a few years the fences and tracks needed changing and the plastic gets covered in wax and so forth.

Electronic Solutions, (02) 427 4422, has an answer to the problem. It is a microcomputer program that allows you to draw a map of anything to any scale and it is simple to use. The package is called CCS Designer and is billed as a complete PC CAD system. The software creates scale drawings on an IBM compatible personal computer with a minimum of 512K of memory and supports a plethora of cards and printers.

The package consists of a manual, a quick reference card, a sticky label command summary and two disks. One disk is for ordinary mortals and the other disk contains the same program configured for 8087 math co-processor equipped machines. The manual is legible, logical and attractively presented. I rate it about eight out of ten.

NIK MILLARD/NEGATIVE IMAGE KORPORATION

Electronic Solutions, (02) 427 4422, has an answer to the problem of expensive mapping software – it is a microcomputer program that allows you to draw a map of anything to any scale. The package is called CCS Designer and can be used to create scale drawings on an IBM compatible personal computer with a minimum of 512K of memory.

NIK MILLARD/NEGATIVE IMAGE KORPORATION

Current advice is that land should be managed according to the soil types and lie of the land. The present high-tech approach is aimed at creating farm models that will provide a long-term plan which assesses the four resources: land, finance labour and materials. This assessment will be modified by risk factors based on extensive meteorological information.

Three important tips

THE ONLY THING they haven't done is devote one page to the three most important tips: firstly that every map or drawing starts at the bottom left hand corner of the screen; secondly that the exclamation mark retrieves the last erasure; and thirdly that you pan the screen by setting two points (from and to) and 'zooming' the drawing.

These three items can be found by a thorough reading of the manual, but their importance is not apparent until you use the software. The software is great. Any line drawing can be created using any unit of measurement and any scale. Don't get too ambitious for starters because errors are not that easy to correct in a large drawing.

I believe this is one package that could be used to create local area maps for the Land Man system. The lines and points and other drawing instructions are defined in an ASCII file which means that it should not be hard to configure a transfer program. I have struggled for years with PC-Key draw and I am just too thick to make it work, but CCS Designer allowed me to draw a farm plan after a few hours; that includes rushing around on the motorbike with a tape measure.

The program will draw straight lines from point to point or from point 'A' in a given distance and direction to point 'B' which is great for mapping. The directions seem a bit non-standard because their compass starts at East (0 degrees) and goes anti-clockwise. To outline an area of irregular shape all I did was plot the points along the edge and call up the curve command, the program then draws a smooth curve around the ridge or soil type so defined.

CCS Designer supports most of the mice and digitisers around. The printer program is a separate program and is initialised with the Set-up command when first installing the disk. My NX-15 was one of the few that did not get a specific mention in the printer list, but it answers to IBM Proprinter very well so I used that. How does the print program work? There is a choice of two fonts, whether to turn the drawing sideways or three stages of drawing density. The normal density option turns out a dot matrix impression of the display and is fairly quick and the very high-density option turns out a beautiful picture. Arrows look like arrows. The print is clear at the smallest size and it all comes out to scale on the one piece of paper.

The package costs around $150 to $160 retail and is available from Electronic Solutions of P.O. Box 426 Gladesville in NSW. I think it is a useful tool for planning any item that can be represented on paper. If a drawing need only be created once and is forever to be fixed then do it with ruler and pencil, and use a photocopier for copies, but if modifications need to be made from time to time then a CAD package is just the shot and a low-priced one like this is very capable for many farm uses. There are disks of symbols available and these can be had for around $60 or so.

Next month I want to cover some of the more expensive choices using more sophisticated software but still able to be worked by a colour-blind operator using only a key board. □

JEFF PONTON

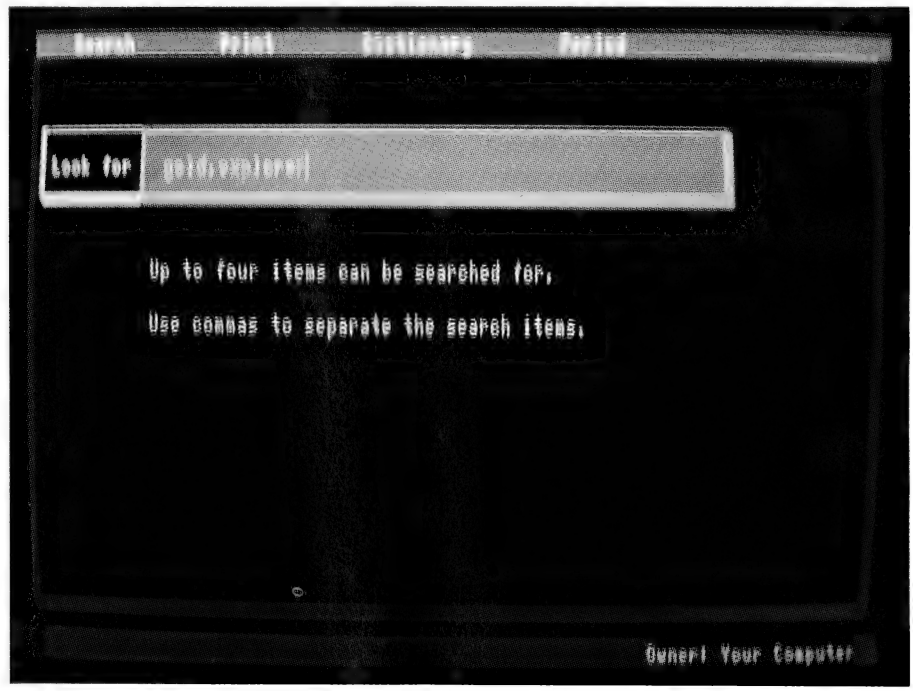
Ways We Were

I ANTICIPATE BORROWING some books on early Australian history from the Public Library during the next week or so. Recently, I've become fascinated with the way John Macarthur and the New South Wales Corps were able to effectively take control of the fledgling Australian colony early in the 1790s and how the apparatus of their authoritarian state was finally dismantled nearly twenty years later. Their power was such that in 1806 the Corps was able to keep Governor Bligh under house-arrest for almost a year.

This episode in Australian history is not merely of trivial interest. It doesn't take much imagination to realise that we can draw some parallels between the social upheavals of the early settlement of Australia, and the colonisation, perhaps centuries hence, of other planets and other solar systems. The problems of distance and the maintenance of social order are likely to be similar.

No, I haven't sold my Microbee and succumbed to an atavistic yearning for the days of sailing ships and flintlocks. Nor have I been appointed Personnel Officer on a manned space mission to Ganymede. But, I have been examining Ways We Were, a database full of fascinating information about Australia from 1788 to 1988. Did you know, for instance, that there was an attempted assassination of the then Duke of Edinburgh in 1868 during a Royal Visit? And, how many of us know where and when Australia's first computer was installed?

Ways We Were is certainly the easiest database I have ever used – it has been designed as an educational tool aimed squarely at the senior primary school level. It is text-based, with the data comprising some 1300 items of information covering the first 200 years of Australia's development from European settlement. The information covers such relevant and diverse fields as government, industry, aborigines, mining, exploration, gold, communication, transport and people.



The Search menu in Ways We Were gives three options: Key Words, A Year, and Quit. The Key Words option allows up to four phrases or events to be u sed as search criteria.

The package comprises a single disk and a helpful manual. Different versions of the program, all on one disk, allow it to be configured to run on a 256TC or on the 64K and 128K Microbees. However, a Premium Microbee is required, as the program appears to use more than one bank of PCG RAM.

Following from a brief introductory screen, the database screen is intuitively simple, yet it is an excellent example of layout and graphic design in the basic colours of red, white and blue. The name of the registered user appears on a twenty-fifth line at the bottom of the screen.

Across the top of the screen are four drop-down menus, Search, Print, Dictionary, and Period. On the 256TC Microbee these are accessed via function keys; the numeric keys 1 to 4 are used on other Microbees. Windows near the bottom of the screen indicate possible choices of action, such as pressing a key to continue, or prompting for a menu selection. The Escape key can be used to exit to the menu whenever a key has to be pressed. The database screen is initially empty. Upon accessing the Search menu, three options are displayed – Key Words, A Year, and Quit.

The Key Words option is the main method of searching for information. A window is displayed, and up to four items or phrases may be entered. If only one item is entered, the program will display all of the information relating to events

and years for which the item is found. If more than one item is specified, all the information for the year in which the items are found will be displayed. It is recommended in the manual that no more than two items should be entered at any one time.

The second option, A Year, prompts for the desired year, and displays all the information available for that year. Whenever a screen of information is displayed, the Dictionary mode may be entered by pressing one of the arrow keys. Any word displayed in the information may be highlighted by further use of the arrow keys to move around the screen; pressing Return will result in a search of the onboard dictionary to find the meaning of the highlighted word, if it is included in the dictionary. Bearing in mind the educational level for which the package has been designed, this innovative concept will be found to be one of the most useful features of the program.

Options

WHEN MORE THAN one screen of information is available, the program prompts for a key to be pressed for each subsequent screen. The current screen may be sent to the printer by pressing Ctrl-P. This results in a sideways dump of the text on the current screen. As the text is printed in graphic mode, a Microbee DP100 printer, or a compatible model, is essential. Options under the Print menu are This Screen, Next Search, and Text File.

Next Search provides a full printout of the next search performed by the Key Words option, even if this extends across several screens. A tick in the menu box indicates that this option is active, and it may be toggled off by selecting it again. Text File, according to the manual, produces an ASCII file of the next search. A tick indicates that the option is active, and it, too, may be toggled on or off. However, this option seems to be the only serious bug in the program, in that it simply doesn't work. It creates an entry, Text.doc, in the directory, but it neither opens the file nor writes to it.

When fixed, and it is to be hoped that it will be, the Text File option will allow screens to be saved and subsequently printed from WordStar, Simply Write, or even Transfer. The major benefits, as outlined in the manual, are that incompatible printers may be used, and information from the database may be incorporated into other documents, such as reports, or essays. The three options in the Dictionary menu are Find Word, Add Word, and View All.

Find Word simply prompts for the user to enter the desired word, and, if it is in the dictionary file, the meaning is displayed. Add Word allows words and their meanings to be added to the dictionary file. The definition must be limited to one line of text. A significant drawback of this option is that there is no provision for the editing or deletion of existing words from the file. The only solution would seem to be the erasure of the file, Diction.dta, and the commencement of a new one, with the consequent retyping of all the entries which may need to be retained – surely an extreme measure!

View All provides a listing of all words and their meanings in the dictionary; this listing can be printed. The two options under the Period menu are All Years and Set Period. The latter option prompts for the first and last years of the desired period. This is a useful option when the known period for a given search has been narrowed down.

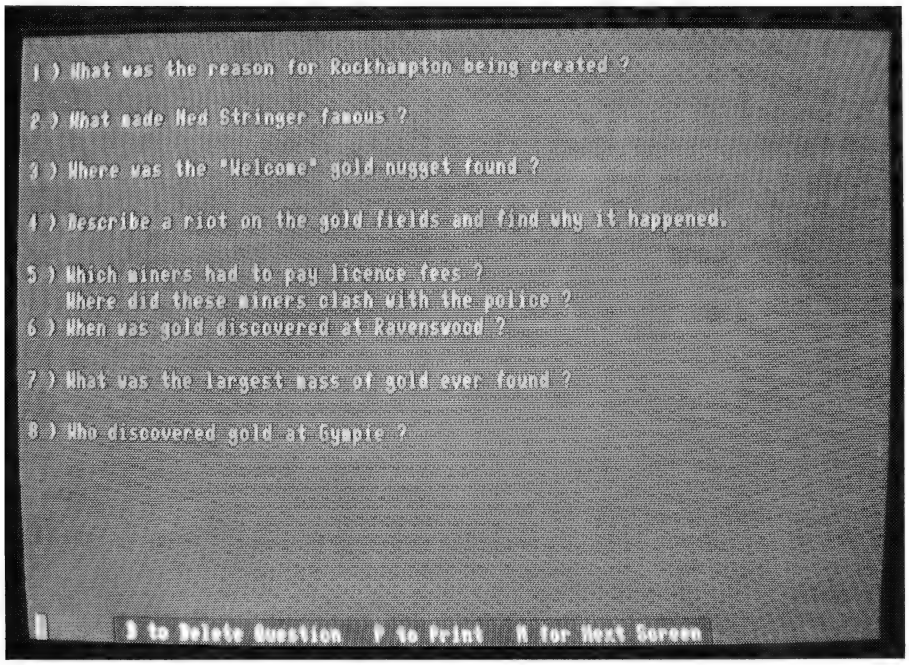
Two utility programs, Question.com and Edit.com are designed to assist in class preparation and program modification. Question.com allows the teacher to print out selected questions from a range of more than 180 relating to material in the database. Further questions can be added to the file, existing questions can be edited or deleted, and the questions can be sorted according to various criteria.

When choosing questions for class use, the teacher may select a particular category, a time period, or questions containing a specific word. Two of these criteria may be selected together, if desired. The questions can be sent to the printer one screen at a time. All of the questions supplied with the package are also printed in the manual in four sections, covering each of the relevant periods.

The other utility, Edit.com, can be used to change or expand the yearly information contained in the database. Each year has provision for eight lines of information. Both utilities supply ample screen prompts and are simple to use. An enthusiastic teacher will find plenty of scope for customising the database, and the questions, to suit local requirements or to concentrate on particular aspects of Australia's development.

There are occasional inelegant blemishes in the graphics of Ways We Were, but these are all fairly minor and they in no

If only one item is entered for a Key Word Search, the program will display all of the information relating to events and years for which the item is found; if more than one item is specified, all the information for the year in which the items are found will be displayed. The second option, A Year, prompts for the desired year, and displays all the information available for that year.



Two utility programs, Question.com and Edit.com are designed to assist in class preparation and program modification. Question.com allows the teacher to access the range of more than 180 and further questions can be added to the file, existing questions can be edited or deleted, and the questions can be sorted according to various criteria. Edit.com, can be used to change or expand the yearly information contained in the database.

way detract from the tremendous usefulness of the package. The program is successful in allowing speedy access to historical material which can then be concentrated upon by both the class and the teacher. The computer is firmly put in its rightful – but all too rare – place as an educational tool, and not allowed to intrude between the class and the material.

Ways We Were was written by Len Boughton for Grapefruit Moon Software. It is distributed by PRIMUG, Dennistone East Public School, Lovell Road, Eastwood, NSW 2122. The price is $55.

To 'Bee or not to 'Bee

A FEW MONTHS ago, I received a letter from a software company which I had approached with a request for details of any Microbee applications they may have been developing. Their reply, in essence, was that they considered the Microbee to be totally inadequate for either educational or commercial applications. They believed the Microbee to be too slow for serious word processing, and they could not envisage a business which would be small enough for the Microbee to be used efficiently.

The letter was obviously the printed output of a word processor, but the layout was perhaps the most unprofessional I have ever seen. The name of the company was boxed, asymmetrically, in a frame of Ms, the formatting of the letterhead was haphazard, and my impression was that the company could profitably invest in a product like Flashprint, or even a refresher course using the WordStar training manual. Unfortunately, the letter gave no indication as to which computer or which word processor the company was currently using.

The effect of the letter, however, has been to prompt me to step back and take an objective look at my Microbee and the ways in which I use it. I have a 128K machine with twin 5¼ inch drives and a colour monitor.

Probably my major use for the 'Bee is word processing. I write letters, articles, stories, source code, and keep files in a number of areas of interest. A few months ago I needed a much more professional printout of a writing project than I could get from my dot-matrix printer. I ported the two WordStar files to a friend's Macintosh and used a desktop publishing package to format them to the standard I required, then printed them in a native font on his ImageWriter. No problem, and the original stories were written, using WordStar, on the Microbee. They subsequently earned me a total of $5800.

Occasionally I submit articles on disk to editors or publishers, including the magazine you are reading now. It is usually sufficient merely to send the files on a Microbee-formatted disk, which can be read using PC Alien or a similar software package. If the commercial publishing world required these files on disks of some other format, I'm sure they would quickly inform me. In all likelihood, however, they would still accept them – if not require them – as WordStar files.

Regarding the relative merits of word processing on the Microbee, I have used different versions of WordStar on an IBM-compatible DOS computer, but with no appreciable increase in efficiency or speed, other than when using the command to Save & Resume, with a hard disk. I should mention, perhaps, that my writing is essentially creative, and consequently there is almost never any need to type at a professional speed, as might be the case when transcribing notes or shorthand. Using WordStar, however, I have never experienced dropped keystrokes, even on those rare occasions when my typing has been at a finger-blurring speed (usually only by repeating a short series of keystrokes).

Perhaps the only area where the Microbee is found wanting in word processing applications is in the training of people to use a computer in an office environment. Obviously, it would be an advantage for trainees to development familiarity with the more commercially oriented PCs, with their function keys and numeric keypads, but the lack of these features certainly does not inhibit one's ability to master the WordStar package. Having taught courses in word processing, both on CP/M systems, in particular the Microbee, and on DOS systems, I believe I can attest to this.

As a part of the development of a software package which I have been working on for several months, I use dBase II. Because the format of the raw data is not yet in its final form, it is convenient to manipulate it using the power of dBase II. I will eventually write a filter to compress and re-write the data so it can be accessed in whatever way will be most efficient for my application.

Meanwhile, dBase II is certainly more

than adequate for my needs. Further, should I subsequently want to manipulate the original databases on another machine, utilising, say, dBase III, file compatibility is assured. Further to the development of this package, although it will eventually require a machine with at least a couple of megabytes of RAM, to be run efficiently, I am quite content to use the Microbee for writing the source code, in C, and to compile and debug all of the various components. When it is finished, I will look at the available hardware to see which environment, Macintosh or DOS, best suits my needs. Porting the source code and re-compiling it will be the simplest of tasks, as will porting the databases.

I haven't used any accounting packages with the Microbee, except to examine them for their suitability for reviews. In fact, I'm barely conversant with Multiplan, which came bundled with my computer four years ago. So, I am not able to directly assess the suitability of the Microbee as an accounting aid in the running or management of a small business. However, I know that a number of primary schools rely upon a school accounting package, from Goodison Software, for all of their accounting, including budgeting. This package was developed specifically for the Microbee. Further, I am aware of at least a couple of small businesses which have successfully adapted this package.

Desktop publishing

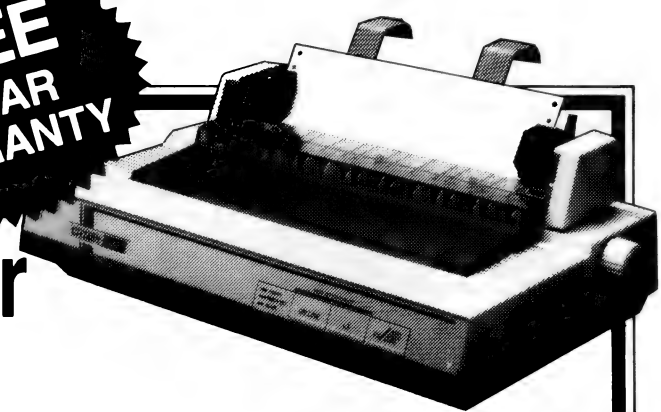
I AM THE FIRST to admit that the Microbee lacks the speed, the power, and the software to be competitive in desktop publishing. Products like Flashprint allow the enhancement of output from existing word processing packages, such as WordStar, but the creation of anything more complex, particularly for a commercial market, which may require the use of graphics, really needs a product like, say, PageMaker and a machine to run it.

But remember that we are discussing small businesses. How many small businesses – and I include, for instance, farms, plumbers, builders, freelance writers, one-person contractors in general – have a pressing need for publishing applications? For that matter, it is a moot point whether many businesses, regardless of size, can point to an increase in their efficiency, profitability or productivity which can be attributed to desktop publishing applications.

My Microbee is in constant use, at least six days a week, and the only time I switch it off is when it has to be moved, which seldom happens. Of course, I switch off the monitor whenever I'm not using the computer. One problem which is an intermittent pain on the Microbee is the gradual decay of the keyswitches under the keyboard. This is usually characterised by having to press a given key several times to get a character. So far, I've had to replace half a dozen keys, and now a couple more are starting to degrade. Fortunately, replacement is a relatively straightforward procedure, requiring a minimal amount of soldering. In a future article, I will describe and illustrate the procedure.

In short, I believe that the Microbee performs very well in those areas which are most directly related to small businesses: word processing of letters, including Mail-Merge applications; databases of stock and of clients, with their particulars; and accounting systems. □

FREE 2 YEAR WARRANTY



...and the Citizen 5200 printer for under $400

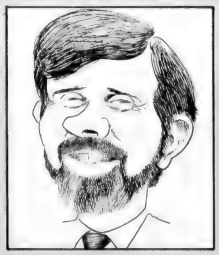
Right now, Pantek and dealers throughout Australia are offering the amazing new Citizen 5200 personal computer printer for under $400 with a FREE two year warranty.

Not only do you get 120cps print speed, high resolution graphics capabilities, superior print quality, Commodore interface and compatibility with all popular PCs and software, but a host of other features that have made Citizen printers world famous.

Pantek

Why not ring and find out for yourself?
PANTEK CORPORATION PTY LTD
Vic. 699 5097. NSW 887 9333. QLD 844 4000.
SA 363 0033. WA 361 0954

MKADD/2333



JOHN HEPWORTH

Lharc, Spaz and Arcmaster

I KNOW I PROMISED not to talk about archiving programs again, but I can't avoid it, and will just have to be very brief. By now you are all familiar with .arc, .zoo, .pak and .zip files. Now comes .lhz files, created by the Japanese shareware program Lharc. While slower than some other archiving programs, Lharc does create very small archives and is becoming popular with many boards as it saves disk space and transfer time.

Trying to remember the different syntax for all the various archive programs is a pest. I have mentioned Shez in the past. It is now in version 3.8, and it is still my favourite shell for driving Lharc, Pkpak, Pkunpak, Pkzip and Pkunzip to manipulate .lhz, .arc and .zip files. There are two more shell programs worth looking at. Both ArcMaster and Spaz can run all the PKWare and SEA Arc programs, plus Lharc, Pak and others.

ArcMaster, now in version 4.3, is a full function shell that uses the various archiving programs to create, extract and browse archives, and can call LIST to read an individual file in an archive. Spaz version 1.4 is a simpler shell. It looks at an archive file, or group of files, works out which program created them, and calls the appropriate archive programs to extract the components of the archives. It cannot browse files, create archives or use LIST to browse files inside archives.

One effect of the proliferation of archiving programs is that a public domain or shareware package may surface on your favourite bulletin board with .zip, .arc or .lhz as the extension, or be a self-unpacking archive with an .exe extension. In future, when giving the names of the archive in which an application is found, I will not mention the file extension but just the file name, except for self-unpacking archives where the full name will be shown. In this vein, Lharc is found in the self-unpacking archive Lharc113.exe, Arcmaster 4.3 is in AM43, Spaz 1.4 is in Spaz 140 and Shez 3.8 is in Shez38.

I am getting mightily sick and tired of the constant changes in archiving programs, formats and protocols. Lets all hope that things become a little more stable soon!

Today

WHAT'S GOING to happen today? What has to be done tomorrow or in the next few days? What interesting things have happened in the past on this day and month? All memory is fallible. Often human memory is more volatile and less reliable than machine memory. One of the big problems for most of us is to remember birthdays, house payments and other such repetitive things. Forgetting one or the other can end with us sleeping in the doghouse or in the street!

I am getting mightily sick and tired of the constant changes in archiving programs, formats and protocols.

As a result we have all developed ways of reminding ourselves of important things, or trivial but interesting things. Diaries, calendars and a host of clerical and computer systems are available to help us to remember. Today is a neat little program that reminds us of things that will happen today, or in the next few days, and also amuses with interesting historical items for the day and month. It looks at the system clock, and then looks at its diary files and then displays information for the day, laid out in three categories. These are Famous Birthdays, Special Dates In History and Reminders.

A comment can take one line or several lines. Comments can appear for a single specific date, for every date in a range of dates, or for the same date or range of dates every month or year. It's even possible to specify that a comment is only shown if the date concerned falls on a particular day of the week. Other features include the ability to show comments only once per day, regardless of the number of times Today is run, to control the screen colours used, to wait for a keypress after the day's comments are displayed, and a number of ways to find the data files containing the various comments and reminders for the day.

Today uses a set of 13 diary files at a time. The default names for 12 are Today.mon, where 'mon' is a three-letter abbreviation for the 12 calendar months, while the thirteenth is Today.own. The 'month' files contain lists of a host of famous birthdays and significant dates, albeit with a strong San Francisco flavour. Today.own, a skeleton version of which comes with the package, is used for personal reminders, family birthdays and other similar information. Typically this would have a reminder about birthdays of family and friends for a few days before the event, mortgage payments for the last few days of the month, and individual appointments needing to be kept.

It's possible to have more than one set of 'mon' files, all with the same set of extensions but with different filenames, such as Work.mon or Private.mon, and select the one to be used when running Today. The data files are edited with any word processor or editor that can create files in pure ASCII.

Today is a product of Patrick Kincaid, 618 Douglas Drive, Mill Valley, CA 94941. He seeks no financial contribution from users, but just asks for contribution of information on historical dates and birthdays of the famous, so the data files can be enhanced and expanded. The latest version of Today is 2.3, and will be found on bulletin board as Today23.

ESET

AS A PROGRAMMING language, the DOS batch file leaves much to be desired. Its greatest shortcoming is its lack of an ability to take user input, hold it in a variable and use it later. There have been a number of programs that allow the user to input a keystroke, and set the DOS error level to the ASCII value of the character. This allows conditional branching within the batch file based upon the user's response. But what if you want the user to enter a string, and then later act upon it? You might want a batch file to run a program, and have the user enter the name of a document or data file. You might want the user to enter a mask for a DIR or similar DOS command.

DOS does have variables, which are stored in the DOS environment. If you want to see what variables are active in your system now, go to the DOS prompt, type SET and press the Enter key. Each of the variables will be shown on its own line and its value will also appear on the same line. One that almost certainly will appear is PATH=nnnnnnnn, where 'nnnnnnnn' is the current path. Batch files can act on a variable. Lets say you have a variable called TEST in your the environment, and in it one line says 'TEST=-This is a test.' A batch file that says 'ECHO %TEST%' will display 'This is a test.'

It is possible to create, edit or remove an environment variable from the DOS command line with the SET command built into DOS, but an existing variable must be completely retyped to make a small change, and from a batch file there is no standard way to get the user input and set the variable accordingly.

ESET makes changing environment variables easy. It takes user input and creates an environment variable containing it. ESET is called with one parameter, the name of the variable to be created. If the variable exists it is displayed, ready for the user to edit. If it does not exist, it is created and the user can then insert text. Particularly useful to make a small, temporary change to your path.

While in ESET, the user can scroll left and right in the line, and can insert and delete characters as desired. Pressing Enter terminates ESET and creates the environment variable, while pressing Esc terminates without any change to the variable. ESET does have a limitation. There is no way of specifying an acceptable input, and the user can enter a nonsensical string. This may have undefined results later in the batch file. In general it is hard to validate user input in batch files, except for checking that files exist with the DOS command IF EXIST 'filename.ext' and branching accordingly. If you are not happy about validation of input, it may have to prevent novices from using batch files which contain ESET.

The batch file below is a simple example of what can be done with ESET.

```
echo off
echo Enter the name of the files
     to be listed
echo Wildcard characters ? and *
     are acceptable
goto FILEOK
:NOFILE
echo %FILENAME% does not exist -
     please re-enter
:FILEOK
set FILENAME=
ESET FILENAME
IF NOT EXIST %FILENAME% GOTO NOFILE
DIR  %FILENAME%
DIR  %FILENAME% /w
echo on
```

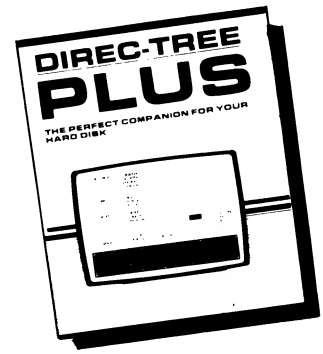
This batch file prompts the user, erases the present string stored in 'Filename,' accepts the user's input via ESET and stores it. Let's say that the user inserts *.exe. The batch file will then check if files exist which match the mask *.exe. If there are any they are first listed in full and then in wide format.

There is a problem with using environment variables. The amount of space in the environment is limited. If you have a long path, or many environment variables, it may be necessary to expand the available environment. The method of doing this varies from one version of DOS to another, so look at your DOS manual. In addition, if you are in a program like Microsoft Word or XTree Pro, and jump out to DOS, the copy of the environment that is now available will just fit existing variables and will have no room for new variables or longer versions of the same variable.

The version of ESET that I examined is 1.2. It is available in ESET12, and is a product of Mike Babulic, 3827 Charleswood Dr NW, Calgary, Alberta, CANADA T2L 2C7.

NEW!

"definitely one of the better programs on the market today..."
PC Magazine (USA)



At last! A program that takes the mystery out of driving your computer. A program that can turn a raw novice into a power user —without having to learn the deepest mysteries of DOS!

DIREC-TREE PLUS gives you complete control over all your disks and files - and so much more. It's a computer management program which not only displays your complete disk tree structure, but also gives you:

- **One key control over all your files and directories, singly or en masse.**
- **100 user-definable menu options for instant program execution**
- **Ten user-defined macros to save work!**
- **Password protection over any/all files**
- **Complete file editing, locking and hiding files, viewing and printing files**
- **The ability to change file attributes, directory names, volume labels - even add a two line note to your filenames to better describe them!**
- **System status . . . And so much more!**

DIREC-TREE PLUS is the most useful piece of software you'll own: in fact, you'll wonder how you did without it. You've probably seen XTree & XTree Pro: **DIREC-TREE PLUS** does much, much more and sells for much, much less: just $79.95!

DIREC-TREE PLUS is available from better software suppliers, or direct from the sole Australian agents. Simply send in the coupon below with a cheque, etc, for $79.95 and we'll send **DIREC-TREE PLUS** pack & post free!

Send to: CompuHelp Australia,
35-37 Higginbotham Rd, Gladesville NSW 2111

ORDER NOW: 7 DAY MONEY BACK G'TEE

Yes! I want **DIREC-TREE PLUS**: the best computer management software available. If I'm not completely happy I know I can return it within 7 days in original condition for a full refund!

Name:.....

Address:.....

.....Postcode:.....

Method of Payment: ☐ **Cheque/Money Order** ☐ **Bankcard/Mastercard/Visa**

Card No:.....Exp:.....

Signature:.....

GREGG FAULKNER

Hard driving

REGULAR READERS of this column may be surprised to hear from me again. Last month I was on the verge of committing a capital offences due to the problems I was encountering while trying to install an auto-booting hard disk drive into an Amiga 2000. That I'm sitting here writing this testifies to the fact that I finally succeeded in my quest. The cause of my trauma turned out to be a combination of a faulty hard drive, a faulty controller card and inaccurate specs for the drive. That combination of errors wouldn't occur again in the life of the universe, so why me?

Just for the record let me express my total delight with the system which finally resulted. The drive is a 28mS 45Mb Rodime unit connected to a Commodore 2090A controller. I formatted the drive into three partitions. A small 1.5Mb old-file-system partition for autobooting and two, roughly equally sized, fast-file-system partitions for software and data.

The machine now boots from cold in about 15 seconds and provides very fast access to all the available software. The problem, of course, is in deciding which software to load onto the hard drive. This is the third hard drive I've set-up for an Amiga and I'm learning with practice. For example, there is no value in loading games onto the hard drive. If I have time to play games then I have time to wait for them to load from floppy.

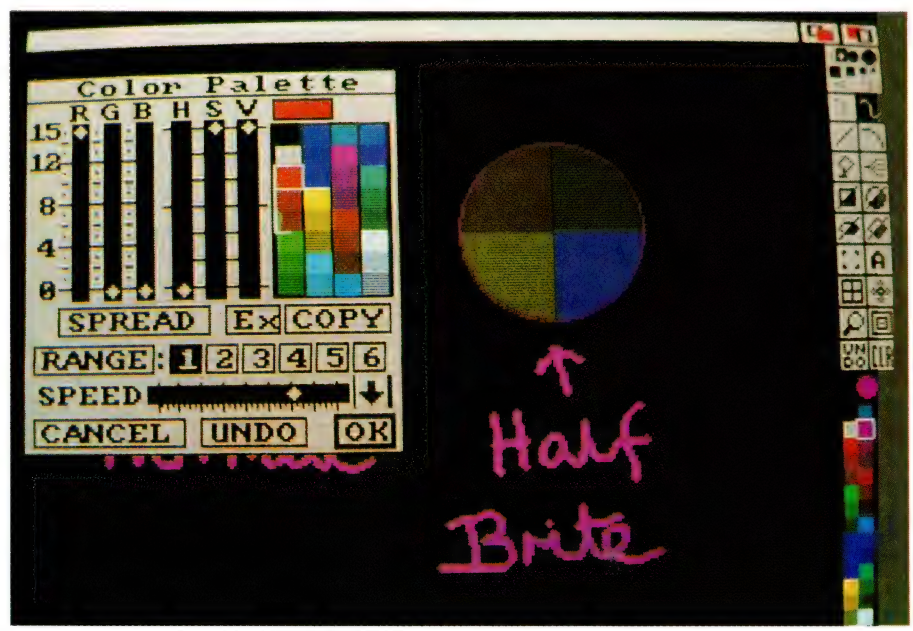
The key to making best use of an Amiga hard drive is to keep the number of icons in any window to a minimum. When I set-up my first Amiga hard drive I simply made a huge root-level window with all the software individually represented by icons. This is fine if you have minutes to spare waiting for the window to fill each time you open it. My technique now is to have only about half a dozen icons in the root-level window. Each of these icons represents another window containing types of software. For example, the root-level window for one of my 22Mb partitions has the following icons: WordProcessing, Graphics, Presentation, DesktopPub, Utilities and DataManagement. Opening the Graphics icon produces a window with icons for Deluxe Paint III, Deluxe PhotoLab, Photon Paint 2, PixMate, Butcher and ShowPrintII.

By arranging the windows hierarchically in this way, each window opens and fills very quickly and allows fastest access to the required package. I have also set-up my 'productivity' software in one partition which I call 'FAST:' and most of my utility software and data in another partition called 'HARD:'.

From experience I would suggest that 45 Megabytes is the cost/size optimum hard drive for an Amiga. Software packages themselves can run to around 2Mb each, and data files, particularly images and PostScript files take up heaps of space. You can get away with a 20Mb drive for a while but before long you will want more. Fortunately the price of hard drives is dropping and with the arrival of optical disks soon prices of magnetic drives should tumble further.

Not sexy, scuzzy!

IF YOU ARE considering a hard drive I would strongly recommend that you choose a SCSI drive and controller. SCSI (pronounced scuzzy though the originators of the type preferred it to be called sexy) stands for Small Computer Systems Interface and it is the most common type used for those MACthingamawhatchits. A SCSI controller can handle up to seven de-



Deluxe Paint III offers both Full-Brite and Half-Brite modes permitting the use of 64 colours on the lo-res or med-res screen. A new addition is the ability to wrap a brush around any regular or irregular shape and there is now a tint mode that permits gentle colourising of black and white (or grey scale) images.

vices as they are designed to daisy chain from one to another. This means you will be able to add future devices, such as optical disk drives, without having to buy extra controllers.

The Commodore 2090A hard drive controller card provides both SCSI and ST-506 control capability and is probably the best available though not the cheapest controller for the Amiga 2000. For the Amiga 500 the newly released Amiga A590 unit combines a 20Mb hard drive and provision for up to 2Mb of expansion RAM into one neat unit which plugs into the expansion port on the left side of the computer.

ProText

ENOUGH ABOUT hard disks and such exotica. My intention this month was to finish my review of ProText word processor. I commenced the review a couple of issues ago and left it incomplete due to my lack of familiarity with the package. Since then I have spent quite some time using ProText and I am happy that it is every bit as good as WordPerfect version 4.1 though I am still bothered by a couple of things.

The authors of ProText should have spent a little time looking at the very friendly requester windows which are being built into the more recent Amiga software. Most new requesters allow you to select a path and a file without even waiting for the whole list to be displayed. Even the older requesters displayed the available options and allowed the user to 'point and click' or select with the cursor arrows – not ProText. In keeping with its origins in the IBM world, ProText provides the following response to a LOAD FILE command: 'Filename:'.

That's it! Just 'Filename:' – no display of available files, or the opportunity to specify the file path. To my mind this is just about a good enough reason not to buy ProText. No matter how good the rest of the package may be, and it is good, I just cannot believe that it has really been tailored for the Amiga. I feel insulted by ProText's authors not bothering to adopt what has become an excellent de facto standard in the Amiga world. If Arnor are serious about entering the Amiga market they must be prepared to do more than simply a quick-and-dirty port across from the IBM format.

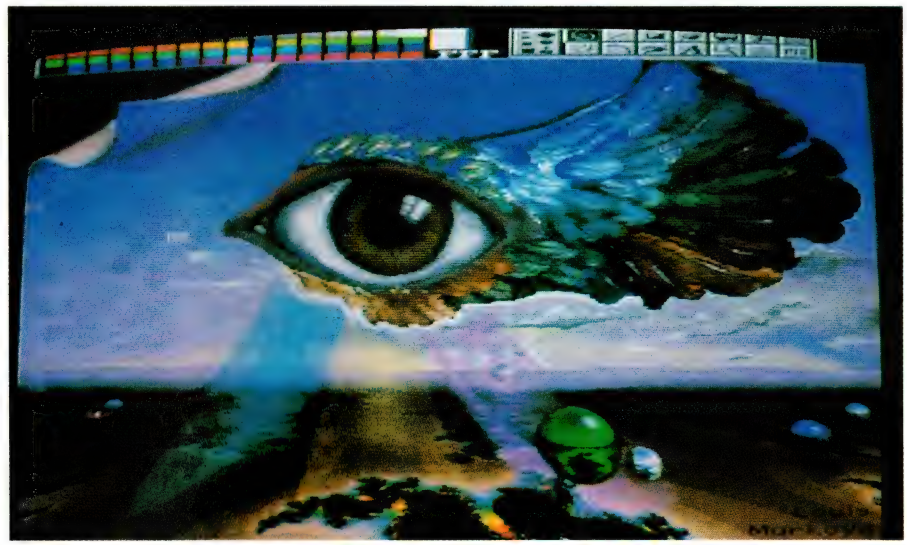
After all that it is only fair that I add a few kind words (if you will excuse the pun) about the functionality of ProText. It is a very good, fast and efficient word processor. I like its visible ruler and the display of important information at the top of screen. The range of control facilities is vast, permitting such things as separate page headers and footers for odd and even numbered pages, printing of only odd or only even pages, and more.

ProText does not permit twenty-seven different fonts and multiple colours in the text, nor does it provide for import of images or text wrap around weird shapes. It is purely and simply a word processor; it very efficiently allows a writer to compose, rearrange and edit text. It has, in common with other professional standard word processors, facilities for mail-merge, spell checking, envelope addressing and so on, and it displays bold, underlined and italic text on screen. Control characters may be hidden or displayed in various combinations as the user wishes.

ProText is in every respect a truly professional word processor. It is very fast and permits an enormous amount of tailoring to suit the particular requirements of the individual user. My only reservation concerns the file requesters. OK Arnor, let's see an update soon with good requesters and you'll have yourselves a real killer package.

At the moment WordPerfect has one big advantage over any other word processor. People who use it at work on IBM or DEC machines can use WordPerfect at home on their Amigas with no change to the controls. Using a translation utility, such as Dos-2-Dos, we can even carry our WordPerfect files from IBM to Amiga and vice-versa. The data format remains the same.

In summary I am happy to recommend ProText as worthy of consideration alongside WordPerfect v4.1 as a top-level word processor for the Amiga. Update versions should be even better, as will WordPerfect v6.0 which may be out by Christmas. Note that I said WordPerfect version 6.0, not version 5.0. The latest word is that WordPerfect Corporation are not releasing version 5.0 for the Amiga (it is already available for the IBM world). Instead they are pressing right on through to version 6.0 and it is likely to be available for Christmas 1989. Roll on Saint Nick!



Photon Paint 2 has also added animation and enhanced its excellent brush wrapping facilities, including illumination and shading controls. The shading is much improved and little trace remains of the former 'blockiness.'

Deluxe Paint III and Photon Paint 2

OTHER RECENT software releases include Deluxe Paint III and Photon Paint 2. Both of these packages are gentle refinements of the earlier versions with one notable addition. Both now include animation capability. Deluxe Paint III detects and fills the full PAL screen and permits the selection of overscan to produce borderless images. For owners of all but the very earliest Amiga 1000s, half-brite mode is also supported, permitting the use of 64 colours on the lo-res or med-res screen.

All the familiar Deluxe Paint II features are there, including perspective, stencil and extensive brush facilities. A new addition is the ability to wrap a brush around any regular or irregular shape. Now even your Coke cans can look just like the real

STEWART FIST

Ever decreasing circles

IT'S ALMOST heresy to suggest this (or even ask the question), but what happens when software gets as good as we'll ever need? Computer hardware and software retailers, and publishers (and computer magazine writers and publishers for that matter) seem to be unified in the mythology that the development of software and hardware will go on for ever. Each new version, they believe, will be an improvement on the last; loaded with added features that the customers will desperately need, and each will be more powerful, faster and better than before.

If you dare to differ you'll be laughed to scorn and will be perhaps be deluged with stories of esteemed scientists who predicted in the 1840s that railway trains would never exceed 30mph, and in the 1940s, that aircraft could never go faster than sound. It is popular mythology that technology constantly moves onwards and upwards.

And this assumption is natural. We live in a technological age, and technology has made such rapid, constant and obvious changes to our lives that we assume all technological systems are open-ended. It is easy for the technophiles to point to many areas of invention and development where improvements were made well past the point that early experts thought possible. But the extrapolation of this principle is fallacious: it is argument by selective instance. The techno-phobe or the techno-realist can also point to areas where technology hasn't advanced simply because the old ways were good enough. I give you: the bicycle, knife, fork and spoon, scissors, the hammer, handsaw, chisel and screwdriver, the pencil and most electric motors.

We are so familiar with these objects that we hardly see them as part of the technological revolution – but that is entirely the point. Remember Sir Clive Sinclair's electric-powered C5-trike and the famous Australian barbecue splade!

Where are they now? The knife, fork, spoon and bicycle were preferred. It is not that we can't make technical improvements on those objects in the list, it is just that improvements aren't really needed. When a tool is good enough, then its design tends to ossify. The customer sets the pace eventually, and although you might convince them to buy a $300 Parker Pen for writing, when they get down to freehand drawing, they will revert to a pencil if the pencil does everything they want. And, don't throw CAD systems on the Macintosh at me! I'll bet you that pencils are still being sold when Macs are historical artifacts in 21st Century museums.

Tools

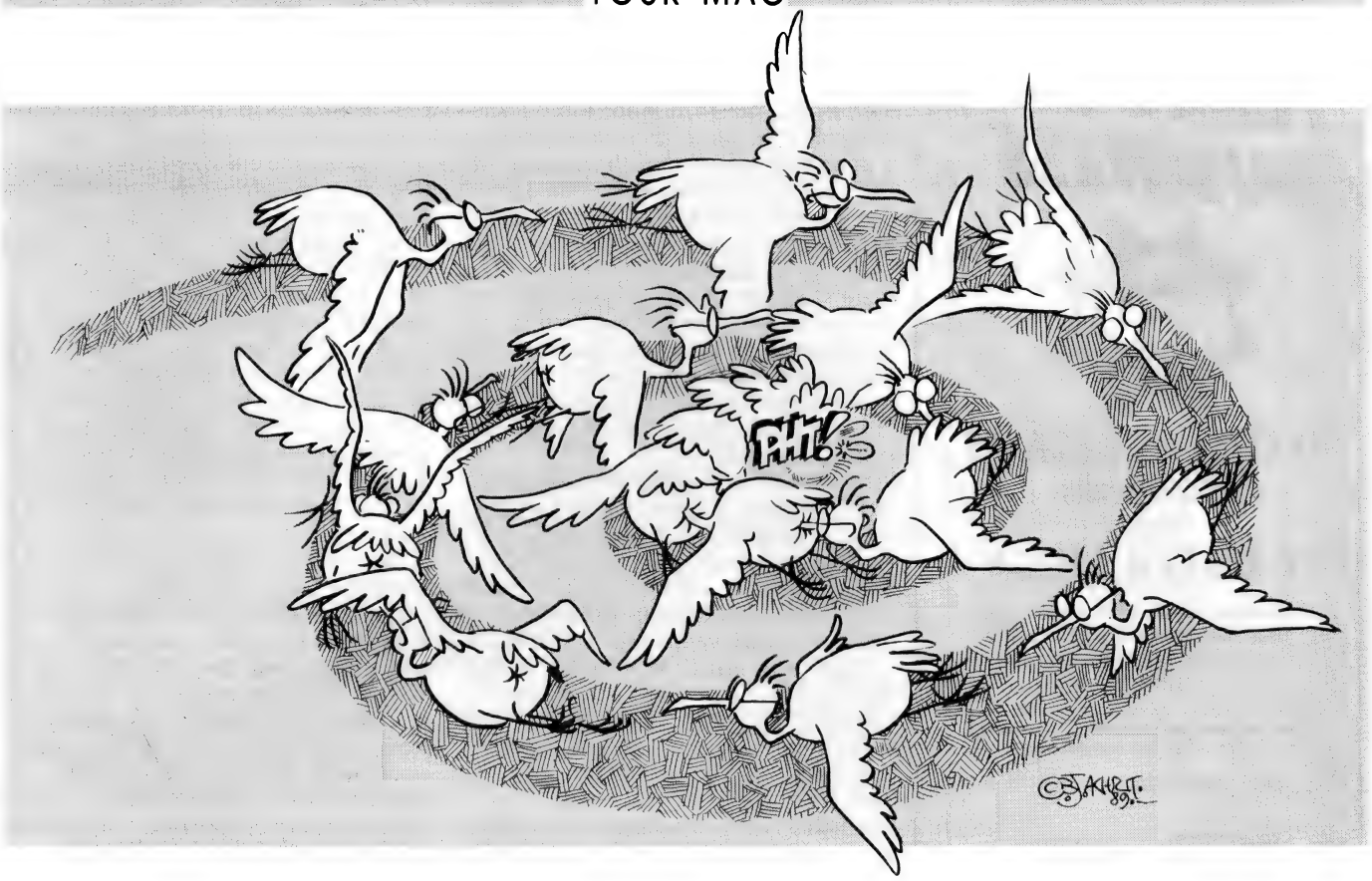
TECHNOLOGY IS about 'tools' – and, in our selection of tools, we take into account factors such as 'familiarity' and 'simplicity' in balance to those like 'innovative design' and 'added features.' The vast majority of applications for our tools are also relatively simple, and so we usually are well served by existing tools. Computers are best with special applications.

I'm not suggesting that any of our present software is perfect, but a lot of it must be getting to the good enough stage. In the last month I've reviewed three outstanding Mac software packages, and in each case it is hard to see that any real customer/consumer improvements can be made after, say, the next version or two. In a scale of 100, I would have to place all three at the 90+ level. Two of the three wouldn't even qualify for an award for 'innovative programming' and they certainly wouldn't figure on most industry lists for 'Software of the Year Awards.' I'm thinking here of FileMaker II, MacWrite II, and Microsoft Word 4.0 – two word processors and a relatively basic database manager.

Claris now own FileMaker II (they bought it from Nashoba) and they've reissued it without any changes, as far as I can see. I suspect they didn't think they could make any improvements and wisely didn't want to risk botching the program up with minor cosmetics.

I can only concur. I will stick my neck out and say that FileMaker II is probably the best program yet written for the Mac. And I don't mean by that, the most 'powerful', or the fastest, or the most feature-laden; I simply mean that FileMaker II does everything that most Mac users would ever want in a simple relational database. Since it works on an AppleTalk LAN, many small businesses could be built around this program without the need for a network specialist, or a procedural language programmer – and that's how it should be.

The only general term I can find to describe this program is that it is 'balanced' – which is almost an aesthetic term. It doesn't have any conspicuous features that are the 'best', or the 'biggest,' or the 'fastest' – but everything merges seamlessly. It is a tool that is exceptionally usable. But FileMaker II is not for large organisations, or for companies that con-



stantly access a lot of data or need sophisticated manipulation of their datafiles. The program has very obvious limitations – but inside those limitations it works superbly.

My point here, is that FileMaker II seems to me to satisfy most of the requirements of its 'niche market' and, although there are some minor changes I would like to make to the program, there's very little of importance that would justify playing around with it. So it is best to leave it alone. I can't see a competitor coming along and knocking FileMaker II out of its niche market. Any gains that such a program could conceivably bring, will be offset by the need to abandon an industry standard.

MacWrite II is another example of a program that is conditionally superb in the same way, and at the same level; it also has very obvious limitations. MacWrite II is unambiguously a word processor. It is not a part-time desktop publishing program, and the fact that it doesn't have 'hotview' links into an Excel spreadsheet is neither here nor there to most users. It

LIVING IMAGE TECHNOLOGY

UNIT 9, 100 HEWITTSON ROAD, ELIZABETH WEST, SOUTH AUSTRALIA, 5113
P.O. BOX 409, ELIZABETH CENTRE, SOUTH AUSTRALIA, 5112

(08) 255 0647

FAX: (08) 287 0598
MASTERCARD BANKCARD AND VISA ACCEPTED

		ONE	2-3	4-9	10+
CONNECT 2400 MODEM	2400/2400, 1200/1200, 300/300 BAUD AUTOMATIC ANSWER/DIAL/DISCONNECT/BAUD FULL HAYES AT COMPATIBILITY TELECOM APPROVED REC. RETAIL $299	295	289	279	269
MAESTRO 2400 2XR MODEM	2400/2400, 1200/1200, 300/300, 1200/75 AUTOMATIC ANSWER/DIAL/DISCONNECT/BAUD FULL HAYES AT COMMANDS/TELECOM APPROVED PROGRAMMABLE OPERATING SYS. REC. RETAIL $399	389	379	369	349
MIRROR III COMMUNICATIONS SOFTWARE	HIGH SPEED, FULL FEATURED PC SOFTWARE. WIDELY ACCLAIMED WITH ABOVE MODEMS ONLY $119 EACH. REC. RETAIL $199	169	159	149	139

DISKETTES

100% CERTIFIED ERROR FREE

HMC BRAND

Lifetime Guarantee

5.25" in boxes with labels, envelopes & write protect tabs

5.25" 360kb at
$6.90
for 10

3.5" 720kb at
$19.50
for 10

3.5" 1.44mb at
$46.50
for 10

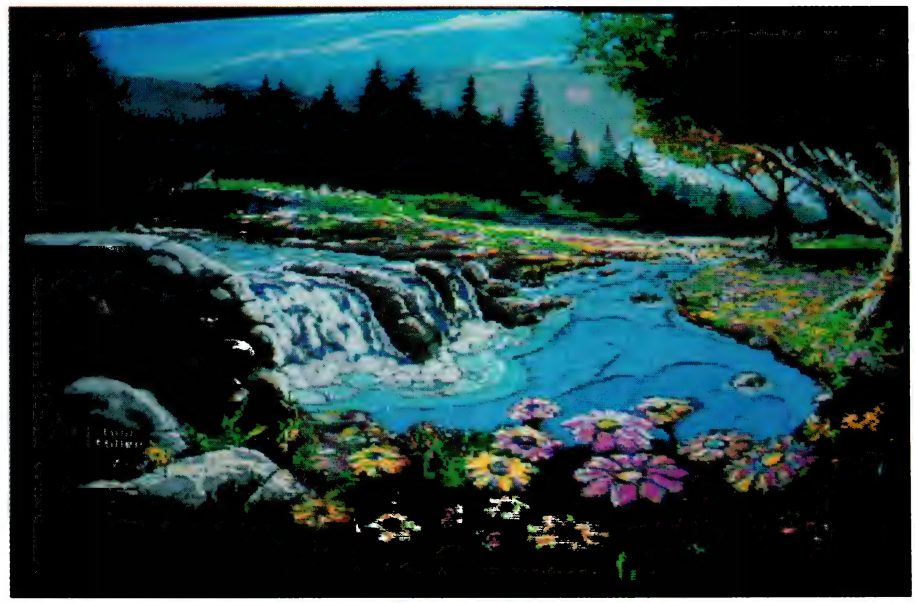
POST & PACKING:
$2.50 per 1 BOX
$4.00 per 2 BOXES
$5.00 per 3 BOXES
up to $7.50 per 10 BOXES

BANKCARD & MASTERCARD WELCOME

COMPTEK COMPUTER SERVICES

4 BUCKINGHAM ST KINGAROY QLD 4610

PHONE (071) 62 3075 or (071) 62 3394



The biggest attraction of Photon Paint remains the HAM colour mode, permitting up to 4096 colours on screen simultaneously.

thing. A tint mode is useful in permitting gentle colourising of black and white (or grey scale) images, like those captured from video with Digi View. Animation is the big news, and it's so simple. Any brush can be animated, simply show DPIII the starting position, tell it how many frames to draw, and spell out the action you want to have occur and that's it! DPIII goes off into a brief trance and creates all the frames of action, press the '4' key and *voila!*

I have been really impressed by the ease with which I can create magic dynamic logos and videotape labels using DPIII animation. After you have created the first item of action you can view it immediately and then add as many more elements as you wish, viewing the result immediately after each step. The end product just gets more and more interesting.

The default animation rate is set at 30 frames per second, to suit American video standard. This setting can be reduced to 25 frames per second without any resulting flicker, and your animation lasts a little longer for the same amount of storage. Any form of animation is hungry on memory and DPIII is no exception. The DPIII package requires a minimum of 1Mb of memory to run. If you have an Amiga 500 with the A501 memory expansion module, or an Amiga 2000, you're cooking.

For best results, if you're seriously into animation, you are going to need more memory. I'm running an Amiga 2000 with 3Mb of RAM and that lets me produce up to several hundred frames of fairly complex animation. I would suggest that this is a useful capacity for most purposes. The maximum configuration of 9Mb would serve a commercial video production house very nicely.

Photon Paint 2 has been recently released and, like DPIII, it now has animation capability. To my mind the controls used in DPIII are more friendly than those used by Photon Paint 2, but I guess that is a matter of personal taste. In any case the end result is much the same whichever package you use.

Photon Paint has always had excellent brush wrapping facilities, including illumination and shading controls. In version 2 these capabilities have been further enhanced and the results have to be seen to be believed. The shading is much improved and little trace remains of the former 'blockiness.' The biggest attraction of Photon Paint 2 remains the HAM colour mode, permitting up to 4096 colours on screen simultaneously. Combine HAM facility with good animation and you have a very attractive piece of software indeed.

I could go on about the new animation packages for ages, but I'd really rather play with them. I can't do that while I'm writing this column so something has to give. See you next month. □

PRICES SLASHED

Model 2400XR

$299.00 Incl. Tax

Telecom Approved

Features - *Automatic Everything* and
- Hayes 2400 "AT" command set compatible
- 27 "S" registers
- Extensive self-testing
- Non volatile RAM
- Call progress monitoring
- Uses the latest technology DSP chip-set
- Asynchronous / synchronous

V.22, V.22bis Bell 103, 212, 2400

2400 B.P.S. FULL DUPLEX MODEM

Money Back Guarantee If Not Completely Satisfied Within 14 Days

The Amazing ... MAESTRO *2400ZXR*

$399.00 Retail Incl. Tax

Telecom Approved

Uses the Latest Technology D.S.P. Chip-set with Performance Equal to or Better than Modems Costing ***$1600.00*** or **More!**

Automatic Everything ... Auto-Answer, Auto-Dial, Call Progress Monitoring, Pulse / Tone Dialling, Line Condition Monitoring, Hayes Compatible.

V.21, V.22, V.22bis, V.23 (300/300, 1200/75, 75/1200, 1200/1200, 2400/2400)

V.23 with automatic bit rate converter

NEW

1234 VPLUS In MODEM

All the features of the 2400ZXR in a PC CARD MODEM

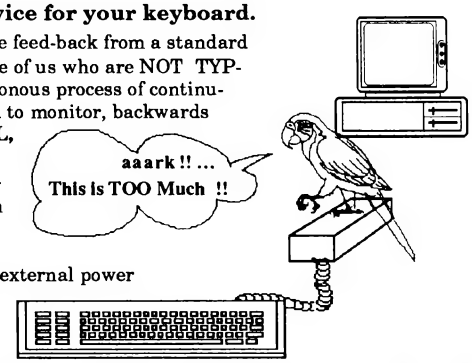
$349.00

KEY TALK is HERE!!

$99.00 INCL TAX

The ULTIMATE feed-back device for your keyboard.

THE PROBLEM: To achieve audible feed-back from a standard IBM or compatible keyboard for those of us who are NOT TYPISTS and who are tired of the monotonous process of continually moving your eyes from keyboard to monitor, backwards and forwards in a *dizzy loop* - **WELL, NOT ANYMORE !!**



THE SOLUTION: Simply plug the Maestro Key Talk between your keyboard and computer (in series with your current keyboard) and instantly you have the **ULTIMATE** in **feed-back ... THE KEYBOARD COMES ALIVE.** It actually speaks the letter as soon as you strike a key ...**MAGIC !!**

SPECIFICATIONS: Requires a standard IBM keyboard (AT or XT) or compatible. No external power supply required. Does not interfere with the standard operation of your keyboard or slow it down in any way. Vocabulary - all QWERTY, ASCII characters plus function keys and control characters. Audio level adjustable.

9600 V.32 Super Executive

V.32 9600 FULL DUPLEX on a standard telephone line

V.32 - V.21 - V.22 - V.23 - V.22 bis ... The absolute latest in technology. Uses an awe inspiring three **digital signal microprocessors,** controlled by a Super 8 microprorcessor running at 20MHz!! Hayes compatible, auto dial, auto answer, auto disconnect modem.

AN **INCREDIBLE $995** (incl tax)

2400 DATA OPTIMIZER

V.22 - V.22 bis - **MNP** Mode 5 data compression with Hayes compatibility, auto dial, auto answer,auto disconnect with error checking. This modem is capable of doubling the data flow withMNP Mode 5. Depending on the file you can reach a staggering 4800 bps peak compression - error free!

Astounding Value!!

$399 (incl tax)

1200 Bit Stream Flyer

$199.00
- Manual dial
- Manual answer
- V.22, Bell 212

Undoubtedly the cheapest 1200/1200 bps V.22 modem in Australia

MAESTRO Pty Ltd

Calool Street, South Kincumber 2256

Phone Your Order NOW **(043) 682 277, 682 278** All Major Credit Cards Accepted

TAKING CARE OF BUSINESS

THE NEW

ELECTRONIC DEBTORS PROGRAM FOR PC ATARI & AMIGA

An 'open-item' invoicing program designed with the small business in mind. It allows the user flexibility unheard of in a software package in this price range until now.

Because necessary operations have not been sacrificed for the sake of flexibility the ELECTRONIC DEBTOR SYSTEM does not lack features and included are:

SALES ORDER ENTRY
INVOICING
CREDIT NOTES
STATEMENTS
RECEIPTS
REPORTS ON SCREEN AND PRINTER
COLLECTION LETTERS

Alternately, do you run a largely cash business? The ELECTRONIC DEBTOR SYSTEM will operate as a 'point of sale' with 'INSTA-RECEIPT'. An invoice and receipt are generated at the time of the sale saving time and keystrokes later.

Do you wish to use a special style of invoice or statement paper? The ELECTRONIC DEBTOR SYSTEM 'free-form' will allow you to design your own layout.

Do you know how much of your business is devoted to selling widgets or whatsits? Using ELECTRONIC DEBTOR SYSTEM you will be able to see at a glance the percentage, dollar value and quantity of sales derived from widgets and the dollar value and quantity back ordered too.

Do you know how much each area or salesperson is earning for your business? The ELECTRONIC DEBTOR SYSTEM will report the details on ten sales areas.

Does each customer have a different payment term? The ELECTRONIC DEBTOR SYSTEM allows 10 different payment terms.

Is credit control a problem? The ELECTRONIC DEBTOR SYSTEM allows you to enter a credit limit for each customer. Upon request you can print a report showing the money owed, the account credit limit and the last date a payment was received as well as the value of the payment received. This option should allow you to make meaningful decisions on credit control.

Worried about the bottom line? Bank manager on the phone wanting answers? No time to print an up-to-date debtors listing? One key gives you the overview of the debtors ledger on screen. Will operate on single and dual drive systems.

ONLY $249.00 PLUS P&P

DEALER ENQUIRIES WELCOME

PITTWATER DISTRIBUTORS
P.O. BOX 814, WOODRIDGE Q. 4114
TELEPHONE: (07) 252 2325
FAX: (07) 854 1574

is a pity they had to abandon the old MacWrite file structure, but the new version is a vast improvement over the old – which had obvious inadequacies. There's no doubt there is still room for improvement in MacWrite II. As a journalist, I want a Word Count algorithm, for a start, but there's no reason why add-ons like this can't be DAs or part of the operating system. Other users might want to add graphic functions and so on, but this would begin to take it up-market and bring it into conflict with the high-end Mac word processors.

MacWrite II is a good general-purpose word-processor for the majority of Mac users – an that's all. If you want something more elaborate, then move up to Microsoft Word 4.0. I hope that Claris make only a few minor changes to MacWrite II, and then leave it alone. They can bring out a super-level MacWrite III series if they want to, but the II series should remain.

I've included Microsoft's Word 4.0 here because it bridges the gap between word processing and desktop publishing, and does both extremely well – except that it is marginally too complex for novice word processor users (they get daunted by the range of choices) and it is certainly not in the PageMaker/Quark Express class of desktop publishers.

Niche market

SO YOU COULD say that Word 4 fits a niche market except for the fact that Word 4 is very highly customisable – and this means that it fills many niche markets. It allows you to standardise on one word processing package right throughout a company or large organisation, and still have: a reasonably simple level of W/P application for some users; a well-featured W/P for advanced users; completely customisable WPs for a range of very advanced niche users; reasonable formatted-file transportability to and from MS-DOS.

Programs like Word 4 almost deserve the title Integrated Package, but that designation doesn't carry the weight it once did. Now with MultiFinder, integration is built-in to the operating system rather than into the application – which is the way it should always have been (I say with the benefit of hindsight). Apple's release of details about version 7.0 of the operating system fixes these changes in place even more so than at present. You've got to admire their ability to come up with newer and better features in the operating system, while still retaining a reasonable degree of compatibility with past hardware and software. It must be an enormously complex task.

I suppose the question then is, when do they stop modifying the operating system? Do users constantly want more features, larger memory access, and bigger toolboxes as the manufacturers assume? At a recent press conference a number of technical journalists put this suggestion to a couple of Apple representatives, and they seemed to be almost surprised that the question was being asked. I doubt that they had ever questioned the desirability of making constant changes to the operating system – each version was obviously an improvement, so why wouldn't users want it?

Yet when you look at software buying patterns, it is obvious that a very large percentage of Mac users have bought only a couple of programs, and have no intention of upgrading. They have made a decision to stay where they are in applications, and so necessarily in operating systems, since a lot of the earlier software won't work with the new operating system. Others will always follow the never-ending upward and onward trends of the US starship Free-Enterprise 'boldly going where no man has gone before' – but they seem to be a decreasing number.

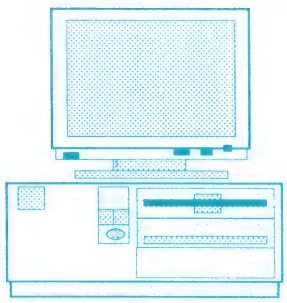
I guess it is natural for Apple to make these high-end changes – but it might also be a good strategy for the company to provide more support for those people being left behind. A lot of worthwhile improvements could be made to the old version 3.7 and 4.1 operating systems which many people still prefer on older Macs. Many of the new 7.0 features could be 'reverse engineered' into these old operating systems without destroying the compatibility advantages that these systems have with an enormous range of software.

The problem is that this would radically alter a software market that is riding high on a wave of programmed obsolescence. In the late '60s this term was applied to deliberately bad-engineered motor vehicles and mechanical consumables – the trick of making them so that they would rust, or fall apart after a day after the warranty ran out. Computer manufacturers and software writers are achieving the same end by over-engineering, and by constantly improving one element in a symbiotic buying cycle. Improve the hardware, then change the operating system, then everyone needs to buy new applications... at which stage we upgrade the hardware again, and the cycle repeats.

But we all know what happens to birds that fly in ever decreasing circles! □

SANCOM COMPUTERS

Affordable Excellence



SANCOM 386-SX

TECHNOLOGY LEADER

32 Bit Microcomputer
running on an economical 16 bit bus
80386-SX CPU 10/16 MHz 0 wait state
21 MHz Performance
1M RAM expandable to 10 M
1.2M Floppy Drive

SANCOM AT

Fast 16 bit Microcomputer

for high speed single user
multiuser or network file server
80286 CPU 8/12 MHz 0 wait state
16MHz Performance
640K RAM expandable to 4 M
1.2M Floppy Drive

SANCOM XT TURBO

Budget Microcomputer

for single user or network station
V20 CPU 4.77/10 MHz
640K RAM 360K Floppy Drive

STANDARD FEATURE :
Dual color & mono video adapter
Serial & Parallel Ports
Battery backed real time clock
102 keys low profile keyboard
OPTIONS :
Hard Disk Drives - 20 to 300M
Floppy Drive - 360K to 1.44M
EGA, PGA, VGA
Above Board Memory Expansion
Mathematic Co-processor

BIG enough to service your need
small enough to serve YOU

Whilst others may sell you their standard computer, at SANCOM, your requirement is our standard.

All sales personnel are technically trained to configure a computer system for your needs.

Every computer is custom assembled in our modern factory to your exact requirements.

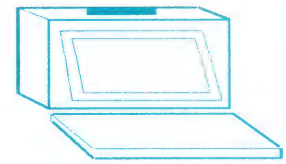
After you have made your wise investment decision on a SANCOM computer, our FAST RESPONSE Service Centre will look after your every after-sales necessities.

SANCOM's own overseas purchasing office and pre-assembly plant, coupled with direct importing and large purchasing power, means better quality control and much larger saving to you.

SANCOM is committed to highest quality and technological innovations. Only the best quality components are selected for our computers & peripheral. Constant technical and market research allows us to keep you in the forefront of technology.

When it's time for your
computer system investment
SANCOM will serve YOU better

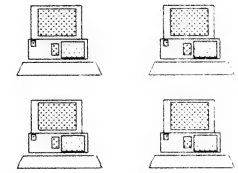
SANCOM 386-SX	
42 M Voice Coil Hard Disk	$3440
SANCOM AT	
42 M Voice Coil Hard Disk	$2340
SANCOM XT TURBO	
33M Hard Disk	$1475
SANCOM PORTABLE AT	
42 M Voice Coil Hard Disk	$3330



SANCOM PORTABLE

Compact transportable computer

for computing power on the move
transportable network station
Super Twisted backlit LCD
CGA Compatible Display
External TTL & CGA Monitor
85 Keys Low Profile Keyboard
Dimensions: 20x24x80 cms
V20 XT, 286 AT or 386-SX



SANCOM NETWORK

One Stop Multiuser Solution

Novell Netwae Ethernet Tape Drive
SANCOM File Server Work Station
Software Hardware Cable installation

SANCOM LASER

Under $3000

Reliable RICOH Engine
6 Pages per minute 1 M RAM
HP & Epson emulation
25 Soft Fonts

SHOWROOMS & SALES OFFICES (Mon-Fri 9:30am to 5pm Sat 9:30am to 12 noon)

Shop F12	level 1, Wallaceway Center, Victoria Street	**CHATSWOOD**	Tel: **413 2929**
Suite 1	10 Woodville Street	**HURSTVILLE**	Tel: **579 3377**
Shop 15	The Mall, 313 Macquarie Street	**LIVERPOOL**	Tel: **602 9088**
Shop 146	313 Harris Street	**PYRMONT** (OPEN SAT TO 3 pm)	Tel: **552 1640**

SERVICE CENTRE & HEAD OFFICE 43 COSGROVE ROAD ENFIELD N.S.W. 2136

Tel: 02 - 742 5188 DEALER SALES 742 5455 CORPORATE SALES 552 3669 Fax: 02 - 642 0228

All Prices include SALES TAX Prices & Specification subject to change without notice

PETER PHILLIPS

That's entertainment

THIS MONTH'S line up covers three different types of entertainment software packages; all from Broderbund. I have one bitch about them all however – the key disk copy protection scheme makes owning a hard disk rather pointless. In one case, I couldn't even get the program to work at all from the hard disk, despite following the hard disk installation instructions exactly.

Because many IIGS owners are likely to fit a hard disk, I believe software companies should allow at least one install from the original disks. This way their beloved copy protection is not violated, yet ease of use is facilitated. It is about time software writers stopped putting obstacles like these in the way of users, particularly for a computer such as the IIGS which is still gathering its devotees. Also, IIGS software benefits greatly from a hard disk in terms of loading speed, and everything should be made easy for such users. Come on Broderbund et al, give us a go...

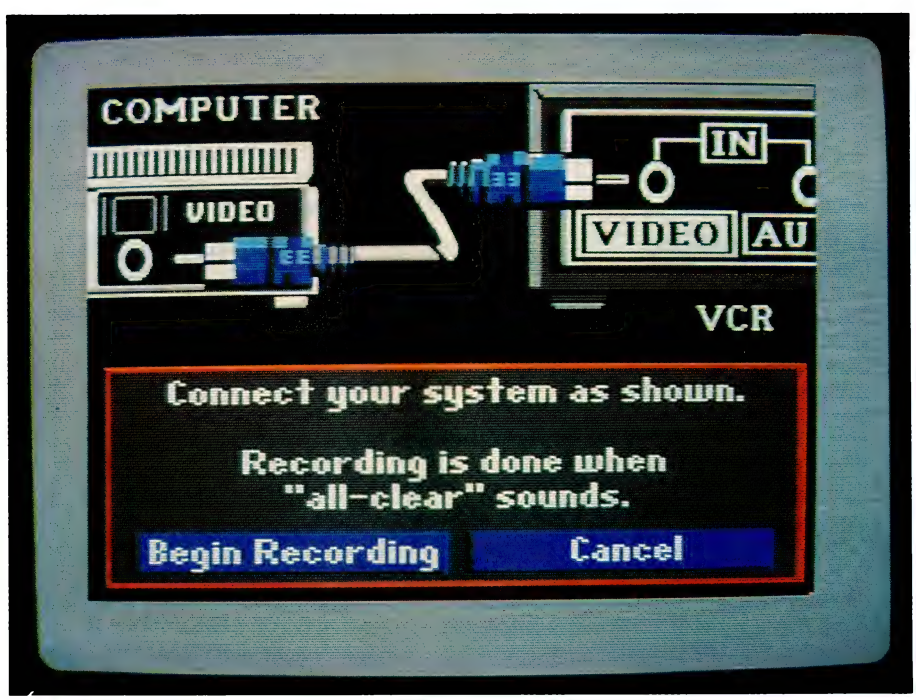
I have one bitch about them all however – the key disk copy protection scheme makes owning a hard disk rather pointless.

VCR Companion

THE PROGRAM VCR Companion is one that has been around for some time, originally written for the IIe/IIc Apples. However, it has now been released in a IIGS version, along with a new supplementary data disk. The review copy was supplied on two 5¼ inch disks, although a 3½ inch version is also available. The data disk was also on a 5¼ inch floppy. I had not seen this program before, and the concept seemed rather useful. The program allows users to produce graphics for use with a video cassette recorder. For example, an introduction, an intermission and a conclusion to a video can be produced then recorded onto the video cassette directly to enhance the recording.

Although the program has a utility option to allow installation of the program onto a hard disk, it didn't work for me, no matter what I did. Sure, it copied the whole program to the hard disk, but when I tried to run it, the request 'Insert disk 1' would appear. No problem, I had the original and I had it in the required drive. Unfortunately the program refused to believe me. So I had to revert to using the floppies. Hence my opening remarks about key disk copy protection. After using the program from the 5¼ inch disks, my advice is make sure you get the 3½ inch version, as both sides of the 5¼ inch disks are recorded, and it is easy to get lost with all the necessary disk swapping.

Once booted, my immediate impression was that the revisions are relatively minor, as the graphics are 16-colour only, and probably no different from a IIe version. However, the IIGS mouse certainly worked, so it was on with the show. The program is very easy to use, and has a



The VCR Companion is used to produce graphics for use with a video cassette recorder – an introduction, an intermission and a conclusion to a video can be produced with excellent effects ranging from scrolling text to fireworks exploding around a fixed picture.

similar format to Printshop. In no time at all, I produced a video sequence with all kinds of excellent effects ranging from scrolling text to fireworks exploding around a fixed picture. The data disk, sold separately by the way, has lots of extra goodies to enhance the production, although those supplied with the program are quite extensive anyway.

It is possible to produce a very elaborate sequence using stills, animation, moving text in various fonts and colours, special effects and so on. I also tried the option called 'Convert graphics' by attempting to convert a graphic from a IIGS paint program (Paintworks) as part of my sequence. However, this was totally unsuccessful, probably due to the different screen formats. The message 'No Files!' kept popping up, even for a data disk full of Printshop graphics.

The final step was to record the sequence onto a VCR. And herein lies the main difficulty with this program. The IIGS is built around the American standards of 60Hz frame rate and NTSC colour encoding, compared to the Australian 50Hz, PAL system. For starters I found it necessary to reset the IIGS to 50Hz operation to obtain a recording without vertical rolling. Reset to 50Hz is achieved by holding the Option key down when power is first turned on. A menu of four options will result, one of which is 'reset to standards with 50Hz.'

Doing this puts all the control settings back to the defaults, so make sure you know what your settings were before undertaking this step. A 50Hz display is not as good as the 60Hz rate, and screen flickering becomes apparent, so you will probably want to revert back to 60Hz operation after the recording.

After resetting the IIGS to 50Hz, and then rebooting to redo my video sequence, I then re-recorded it onto the VCR. This requires hooking the composite video output of the IIGS to the Video IN of the VCR via a suitable cable, then clicking the record icon. Unfortunately, the final result is in monochrome. Everything else is fine – all graphics, text and so on appears, but in black and white, due to the NTSC versus PAL conflict. However, the black and white image is not too bad, and will still dress up a video clip.

One nice feature of the program is that a self booting 'film' disk can be produced. This way, you can write an animated letter or make a product promotion package for direct use via a IIGS. It is unfortunate that the video image via a VCR is not in colour, although I'm told that a PAL colour card as used in previous Apples will work. In any case, the program is a great idea and will appeal to video users or those wanting an alternative means of communicating with a pen friend.

The GS version of 'Where in the World is Carmen San Diego' includes a map of the world with possible cities in which the villain is skulking is displayed, with clues available by clicking the appropriate icon when you arrive at the selected location. The educational impact is subtle, by way of a digitised photo of a landmark of the selected city coupled with a very short description of the place.

This is one of the 'must have' programs of the IIGS range, particularly if you fancy yourself as a detective.

Carmen San Diego

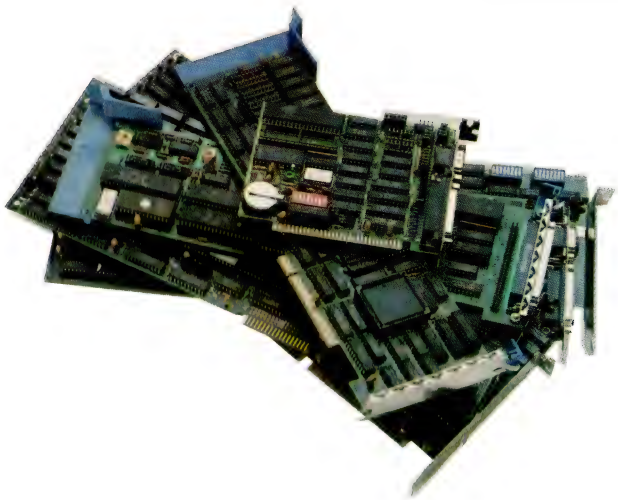
MOST APPLE users will be familiar with the program 'Where in the World is Carmen San Diego', so it is predictable that a IIGS version should turn up. The program is of the learning geography without tears variety, and requires the player to track down a range of V.I.L.E. villains by flying all round the world armed with an arrest warrant. The learning bit comes about through discovering where in the world the particular city is, and also reading about the city. It is an imaginative program, with appeal to both kids and adults. I mean, villainess Katherine Boom-Boom Drib, three-times winner of the Trans-Siberian motorcycle race has to be a wrong doer, doesn't she? Or how about Lady Agatha Wayland, an individual with a predilection for wearing sensible shoes and a diamond the size of a grapefruit!

The IIGS version of the game is supplied on two 3½ inch disks, although one of these is actually a PRODOS version 3.2 system disk. I had only limited luck using the program from a hard disk in that I had to boot-up with PRODOS 3.2 from the supplied disk, whereafter I could run the program from the hard disk. Booting-up from the hard disk with GSOS wouldn't allow the program to load correctly for reasons I've yet to fathom. Once up and running, the program is great to use, and a lot of fun. A map of the world with possible cities in which the villain is skulking is displayed, with clues available by clicking the appropriate icon when you arrive at the selected location. The educational im-

Everex has the Answer

Whatever you need for your PCs, XTs™, ATs® or compatibles, PS/2™ systems and Apple® Macintosh™ computers, Everex has the answer. Everex designs and manufactures products to enhance the power and capability of your system.

From modems to graphic adapters and tape backup, Everex makes more than 100 products — including our popular hard disks, tape backup and memory/multifunction boards. Everex can provide the right solution — at the right price. And Everex products support the newest technologies, from OS/2™ to EMS 4.0. We also have advanced 25 MHz/80386 and 33 MHz/80386 personal computers.

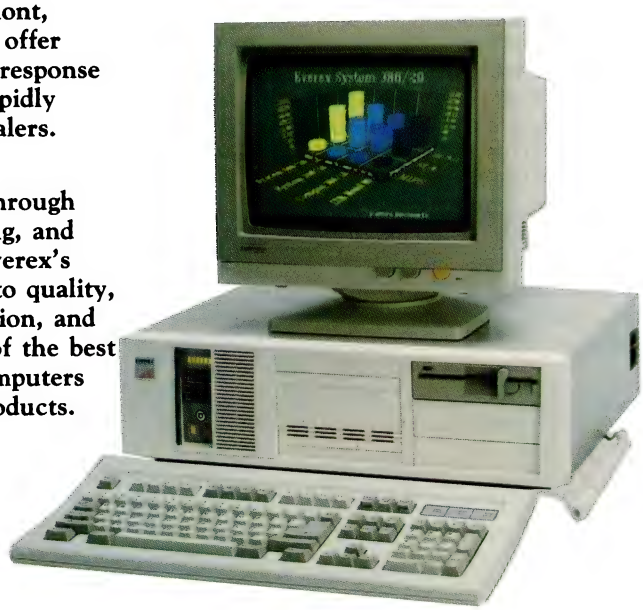


From our beginning in 1983, the people at Everex have provided quality products at affordable prices, with a commitment to personal service. Our honest, straightforward approach has transformed Everex into a multi-hundred million dollar company employing over 1300 people worldwide.

With more than 175 engineers involved in research and development, we consistently develop the innovative PC products that you need. And because 100% of all Everex products undergo final assembly and test in our 250,000 square foot headquarters in Fremont, California, USA, we offer unparalleled quality, response and service to our rapidly growing family of dealers.

From initial design through manufacturing, testing, and after-sale support, Everex's complete dedication to quality, affordability, innovation, and service assures you of the best value in personal computers and enhancement products.

So, whatever your personal computing needs, *Everex has the answer.*



For more information or the name of your nearest Everex dealer please call:

Tel: (02) 427-6111
Fax: (02) 427-5948

Everex is a trademark and EVER for EXcellence is a registered trademark of Everex Systems, Inc. PC, XT, PS/2 and OS/2 are trademarks and AT is a registered trademark of International Business Machines Corp. Apple is a registered trademark and Macintosh is a trademark licensed to Apple Computer Inc. © Copyright 1988 Everex Systems, Inc. All rights reserved.

EVEREX
EVER for EXcellence®

Australia Everex Systems Pty Ltd
Unit 6, 12A Mars Road, Lane Cove,
NSW 2066 Australia

pact is subtle, by way of a digitised photo of a landmark of the selected city coupled with a very short description of the place.

The actual sleuthing requires deduction, coupled with knowledge. As usual, a copy of the World Almanac (1989) is supplied to allow research of the clues. It gets the kids in well and truly, explaining why this program is popular with schools. The IIGS version features mouse operation and extensive graphics, enhancing the program over its predecessors. This is one of the 'must have' programs of the IIGS range, particularly if you fancy yourself as a detective.

For starters I found it necessary to reset the IIGS to 50MHz operation to obtain a recording without vertical rolling. Reset to 50MHz is achieved by holding the Option key down when power is first turned on.

Fantavision

WHEN I FIRST bought my IIGS, someone gave me a copy of a disk called Fantavision. I booted it and was greeted with an amazing array of weird cartoons. Stick figures swimming and being eaten by sharks, monsters turning into other monsters, fantasy graphics doing strange and meaningful things and so on. I mean, here was Weirdsville that put a whole new meaning into escapism. It seemed that all that was missing was a funny cigarette!

But, wrong again. What was missing was the means of creating these cartoons. The disk I had was a 'film' disk, containing only someone's efforts at creativity. So when the actual program turned up, I had the missing link. Now I could do my thing and create sequences along similar lines to those I'd already seen. This program has apparently been around for some time, originally for the Apple IIe and so on. The IIGS version, however, adds new dimensions, including a line up of sound effects and other enhancements. Perhaps I have had a sheltered childhood, but Fantavision was new to me, and I cannot really compare it to the original version. But what an entertaining program!

It may seem like the quintessential time waster – a more rational person might not see the benefit of a sequence of graphics that do oddball things? But then, others might argue the relevance of the Mona Lisa, Wagner's Ring Cycle, or Pink Floyd? Entertainment is a personal thing and I just happen to like stick figures being eaten by sharks and I just wish I had the time to actually sit down and make my own Fantavision films. I've had plenty of suggestions from my fringe dweller friends as to what could be created with this program, although I cannot see how a naked stick figure looks any different from a dressed one. Curse my sheltered childhood!

Creating sequences is extremely easy however. You start by drawing something, anything in fact. The drawing can be a shape, text, an actual picture or just a straight line. The next frame can be a clone of the first, modified or merely repositioned, or it can be an entirely new picture. Once there are at least two frames, a sequence is ready to go. The program uses 'tweening', an Americanism for saying each frame will blend into the next, giving the effect of continuity. So once there are at least two frames, pressing the Go icon sets things going, giving movement that is almost amazing, considering the limited material two frames can provide.

According to the manual, if you draw a stick figure standing upright in frame 1, and then draw the same figure touching its toes in frame 2, Fantavision will run the sequence with as many as 64 intermediate positions, so that the stick figure will appear to bend over slowly to touch its toes. This is clearly a program for those with a creative bent, and it offers incredible scope for self expression. Broderbund will even pay you $100 if you create a film that they decide to use as an example file on the program disk. Being paid to have fun seems a fantasy in itself.

The review copies were supplied by Dataflow and the cost of the programs are: VCR Companion $79.95, VCR Library Disk $39.95, Carmen San Diego $64.50, Fantavision $75.00. A schools version can be bought by paying an extra $20, giving a back-up copy and a 40-page teachers' manual. □

ATTENTION
ALL
APPLE IIe • IIc • IIgs
USERS
UP TO 40%
DISCOUNT
ON ALL
SOFTWARE

Geos (IIe, IIc)	$69.95
Paint/Write/Draw IIGS	129.95
Deluxe Write/Paint 11 IIGS	143.00
Medley IIGS	195.00
Pinpoint (starter) IIGS	149.00
List Plus IIGS	99.95
On Balance (IIE, IIC, IIGS)	59.95
Dac Easy Accounting (IIE, IIC, IIGS)	99.95
Writers Choice Elite IIGS	99.95
Multi Scribe 3.0 (IIE, IIC)	79.00
Multi Scribe GS IIGS	99.00
Bank Street Writer Plus (IIE, IIC)	79.95
The Graphic Studio 2.0 IIGS	59.95
The Music Studio 2.0 IIGS	99.95
Instant Synthesiser IIGS	88.00
TML Basic IIGS	125.00
TML Pascal IIGS	125.00
Art and Film Director IIGS	79.95
Geometry IIGS	79.95
Publish It 2 (IIE, IIC, IIGS)	129.95
Springboard Publisher (IIE, IIC)	139.95
The Newsroom (IIE, IIC)	39.95
816 Paint (IIE, IIC, IIGS)	75.00

August Special On Games

Final Assault IIGS
Mini Putt IIGS
World Tour Golf IIGS
Impossible Mission (IIE, IIC, IIGS) all $29.95
Sub Battle (IIE, IIC, IIGS)
Destroyer (IIE, IIC, IIGS)
Dive Bomber (IIE, IIC, IIGS)
Street Sport Soccer (IIE, IIC, IIGS) $19.95

Over 500 programs in stock which include almost all Educational, Entertainment and Productivity Titles.

For more information call
TWO SERIES SOFTWARE
PH: (02) 606-9343
or write to:
West Hoxton Post Office
N.S.W. 2171
(Fax orders taken on the above number)

VISA
MasterCard

Mail Orders Welcome

THE FORTH COLUMN

ROY HILL

Forth by the book

I HAVE RECEIVED another book from Prentice-Hall on Forth. Its title is Mastering Forth and it is written in collaboration with Advanced MicroMotion Inc, who developed several versions of Forth for the Tandy series of computers and for Apples running F79. The book, however, is a general introduction to the Forth Language, with specific references to F83 on which the book is based.

The authors appear to have contracted Brodeyitis, as it is written in a very similar style to those works of Leo's, with illustrations very reminiscent of Brodie's, although these were done by Jennifer Brosious. The examples used throughout the book are particularly relevant and should work perfectly on all versions which follow F83. Only minor changes would be necessary to about five per cent of the words to have them operate under FIG Forth. One of the examples is shown below:

Here is **CLEAR** in more detail:

Word	Stack	Action
	?	Anything could be on the stack here.
BEGIN	?	Marks the beginning of an indefinite loop.
DEPTH	? n	Leaves the number n of items on the stack, not including n itself.
WHILE	?	Executes the following if n is true, that is, if there are items on the stack (DEPTH > 0). If n is false, execution skips to the word following REPEAT. In other words, the program exits the loop when the stack is empty.
DROP	?	DROPs an item from the stack. The stack might now be empty.
REPEAT		Continues execution at the most recently compiled BEGIN.
;		Ends the definition. WHILE skips to here when it exits the loop.

Note the use of the flow control diagrams, showing the possible paths through the definition. Throughout the whole of the book, examples such as these are provided with clear explanations as to how they operate. This makes the book an ideal first book for the prospective Forth programmer.

Cost of the book is $42.95 and it should be available through most outlets, or direct from Prentice-Hall in Brookvale. Another useful addition to the reference library.

F-PC

IN MY READINGS I have come across a new release of F-PC (or F88 as it is also known). I don't know if anyone locally has a copy, but I will attempt to get it direct from the States. The cost for the package is US$75 and this includes a Users' Manual and a Technical Reference Manual. When I obtain a copy (once again, it's in the Public Domain), I will make it available under the normal arrangements.

Forth conference

AS MOST READERS will now be aware, the 1989 Forth Conference did not eventuate. However, the good news is that there will definitely be one in NSW in 1990. Paul Walker and I will be organising part of it and we hope to have just as interesting a line up of guests as we did in '88, possibly including Leo Brodie, this time.

If there are any members of the public out there who would like to present a paper, demonstration or workshop, would they please let either myself (through this magazine) or Dr Paul Walker (University of Sydney, Department of Physics) know of their interest. It is important to remember that this is not a conference for academics or people with four hundred years of programming experience. It is for anyone who is interested in Forth. Let's see if we can break 1988's attendance level at this conference. It will be held in either Sydney or Melbourne and will once again be supported by the ever-reliable Ken Curry, of Energy Control in Brisbane.

Beginners' section

ONE OF THE most powerful features of Forth is the ability of the user to extend the compiler and create new constructs and defining words. One wouldn't expect the complete novice to immediately set about modifying the compiler, but for those with a little Forth programming experience, this ability is one of Forth's most powerful features. Over the next few months I will be exploring this feature in some depth.

Firstly let's start with something familiar – the word 'variable.' What variable does is create a single byte memory location with the appropriate label (or name). For example, '0 variable counter' allocates a single byte of free memory as a storage location for the variable counter and initialises it to the value zero. Let us suppose we don't have a Forth word called variable (a very primitive system) and we wish to Create this word. This is how it's done:

```
: VARIABLE CREATE BYTE ALLOT ;
```

When we now execute 0 Variable Counter, the word Variable operates like this – Allot uses Here to find the next free memory location and uses Byte to mark that location. Here is now incremented by one. Counter now points to this location and the initialising value is stored therein. For next month's homework. think about how a double precision variable would be defined.

General news

THANKS TO ALL those readers who write in and express their views and ask for info on various topics. It would appear from the correspondence that beginners would like more beginner-type things, programmers with intermediate experience would like more intermediate work and advanced programmers would like more of the advanced type of program. Hmmm! Once again I'd like to suggest that if readers have an interesting program, I would be happy to share it with the rest of the world. □

FREE READERS' CLASSIFIEDS

RADFAX 2
High-resolution weather fax, morse and rtty receive program for IBM PC/XT/AT on 360K 5¼ inch floppy and full documentation. Need CGA, SSBhf, FSK/Tone decoder. Has re-align auto-start view save print. Also RF2HERC same as above but for hercules card, and RF2EGA for EGA card (640 x 350 mode). Programs are $35 each plus $3 postage only from M. Delahunty, 42 Villiers St, New Farm, 4005. Ph (07) 358 2785.

Wanted
Japanese word processing package for IBM PC urgently needed by professional interpreter. Please send details to: Hiroko and David Moore, 4 Barnes Grove, Chelsea, Vic 3196. Ph (03) 772 0529.

Glyphic software
Top-quality hard disk tune-up now only $49 (cheque or BC/MC) – to defragment and optimise disk partitions up to 32Mb and 4000 files for MS-DOS (PC/XT/AT) – brings your hard disk back up to speed! PO Box 391 Pennant Hills 2120 or call (o2) 484 3827 (ah).

LED moving message board
Build your own LED moving message board. $75 for a four-character display experimenters short form kit and $150 for 16-characters. Kit consists of PC boards, Eprom and full instructions to complete project to a professional standard. Loaded form Centronics printer port, or PC/XT keyboard. Equivalent commercial units start at around $1000. For more information send a 39c stamp to Don McKenzie 29 Ellesmere Crescent, Tullamarine 3043.

Public domain
Four dollars per disk (5¼ inch IBM) full of programs. You choose the disks you want and we do our best to squeeze them onto the least number of disks. Where possible, we compress programs from two or three disks and put them on one disk. Send $4 for our catalogue disk, and ask for your free utility or games disk. New Rainbow, PO Box 244, Broadmeadow NSW 2292.

Amiga software
Amiga owner wants to swap/buy software. Lots of programs. Send lists/disks to: David, 130 Aberdare Rd, Shenton Park, 6008.

For sale
HP Vectra ES/12 – 40Mb hard disk, 1.2Mb floppy, advanced colour graphics and HP colour monitor. Plus business software. $4250 ono. Ring Phill (044) 651 104.

For sale
NEC Powermate APC IV – 2 x 40Mb NEC Voice Coil hard disks, 2 x 1.2Mb floppies, 640K plus 4096K extended RAM, 80287 chip, EGA, NEC multisync monitor. $7750 ono. Ring Phill (044) 651 104.

Wanted
Wanted to buy – NorthStar Advantage. Phone Robert Armstrong (049) 59 2400.

For sale
Premium Microbee 192K, with monitor, manuals, 80 programs, many texts. $400 ono. Epson MX-80 printer and Microbee cable $250. Call for details – Michael (052) 61 4372.

Atari user's club
Join the Atari ST user club and BBS. Contact A.M. Brown, 49 Banbil Crescent, Dapto NSW 2530. Free disk.

DEALERS, distributors, mail-order houses and other commercial organizations or individuals who have a message to spread can take advantage of our Market Directory – small ads to help those searching for outlets, services and equipment. For details contact *Your Computer* on (02) 693 6626 or write to PO Box 227, Waterloo 2017 NSW. DISPLAY ADVERTISEMENTS (50mm deep x 60mm wide) in the Market Directory are $125 per insertion if finished artwork is supplied (Set and Makeup is $40 extra for the first insertion only). Payment must accompany copy. Closing date is 6 weeks prior to the month of publication.

FREE CLASSIFIEDS are for readers only, not commercial organisations. The first 20 words are accepted free of charge with a charge of 20 cents for each additional word. Good quality black-and-white prints may be included for a charge of $10 each. Multiple classifieds in one issue are treated and charged as singles.
COMMERCIAL ORGANISATIONS can place classifieds for a charge of 35 cents per word (minimum charge $10). Black-and-white photographs may be included for a charge of $20 each.
PRINT OR TYPE your ad clearly and legibly, double-spaced, and separately include your name, address and phone number for checking purposes, even if these are not to be included in the ad.
Any payment due must accompany the copy.

market directory

HARD DISK DRIVES

10 MB KITS	$295
20 MB KITS	$395
30 MB V/COIL	$495
44 MB V/COIL	$645
85 MB V/COIL	$895

FLOPPY DISK DRIVES

360k $125 720k $150
1.2m $175 1.44m $195

For all your hardware needs
CALL NOW & ORDER!

Pacific Rim Enterprises
P.O. Box 80, Redcliffe, Qld 4020.
Ph: (07) 203 8003
Fax: (07) 203 6053

MOVING CLOSER

As we do more and more research into the causes of Multiple Sclerosis we move closer to finding the answers. A cure could be only dollars away.

MS
Multiple Sclerosis.

SERVICES PAGE

LETTERS TO THE EDITOR

We are happy to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.

SUBSCRIPTIONS

Standard 12-issue rate within Australia: $42. Standard 24-issue rate within Australia: $79.80. Surface rate for New Zealand and Papua New Guinea: $51.80; airmail rate: $57. Rates for other countries on application. All overseas rates quoted are to be paid in Australia dollars. Allow up to eight weeks for subscription processing.

BACK COPIES

Back copies of *Your Computer* are available from The Federal Publishing Co, PO Box 227, Waterloo 2017 at A$4.00 each, including postage for Australia and New Zealand. We will supply photostat copies of articles where a back issue is not available, at the single-magazine price for each feature copied. A special service is offered for tutorials: see below.

TUTORIALS

All parts of tutorials published within the last two years are available as photocopies for a charge of $0.50 per part, plus $4 for postage and handling within Australia (overseas postage additional). Please identify the tutorial by its complete name and specify the parts by number or the issue of publication. All but the latest of our tutorials are listed in our five-year index, published with our July 1986 issue.

READERS' ENQUIRIES

We will make every effort to answer readers' written enquiries, if accompanied by a stamped, self-addressed envelope, although staff shortages and deadline pressures may cause delays. Please include your telephone number(s) with any enquiry. Phone enquiries not related to subscription, readers' advertisements, or other service information cannot be accepted.

COPYRIGHT

All material appearing in *Your Computer* magazine is copyright and cannot be reproduced in part or in full, by any means, without the written permission of the Publisher or Managing Editor. Computer clubs and schools can, however, apply for restricted permanent reproduction rights for non-commercial, limited-circulation use (for example, newsletters and class instruction). Given that it sometimes takes us a while to answer such requests, you can consider that restricted permanent rights apply in these cases from the day you send in your letters, and will later be confirmed (or withdrawn) by our reply.

LIABILITY

Although it is policy to check all material used in *Your Computer* for accuracy, usefulness and suitability, no warranty, either expressed or implied, is offered for any losses due to the use of any material from this magazine.

EDITORIAL CONTRIBUTIONS

Contributions to *Your Computer* are welcomed and will be given every consideration. Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope. If return is critical – say it's something you can't afford to lose – then don't send it; we *are* careful, but we're not perfect. Please read these notes carefully to get an idea of the style and format we prefer.

All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by telephone: contributors who have modems and suitable software (in the MODEM7/YAM mould – see our stories on Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

Contribution on Disk: Contributions can be accepted in most disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgment. The preferred medium is IBM standard format single-sided, single-density, 20cm CP/M disks or IBM PC-DOS minifloppies. We can also handle, in-office, most soft-sectored 13cm disks, thanks to PC-Alien – so unless you have a particularly strange format, send it on disk straight from your machine. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error – if the computer typed it, the computer probably accepted it. Print listings with a dark – preferably new – ribbon on white paper, and try to format the output to a narrow (40 characters) width. If they can't be produced on a printer, borrow a good typewriter – handwritten material is likely to sit around the office for a year before someone can find time to type it all out for you. Please provide an account of what the program does, how it works and so on. Any coments of the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies – no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right hand corner). Be clear and concise, and keep jargon and adjectives to a minimum. □

AD INDEX

Alfa ..... OBC
Amstrad ..... 48 & 64
Apogee Technology 121
Autodesk 72
AVO Electronics 78
Bedford 97
BJE Enterprises ..... IBC
Bloomfield 17
Blue Chip ..... 2 & 3
Capsco 9
Choice Marketing 45
Computer Trader 73
Compu Help 129
ComTek 132
DSE ..... 6, 7 & 119
DM Software 32
Everex 140
Federal Marketing ..... 82 & 83
Freesoft 57
Hi-Tech 145
Interface Publications 117
Living Image 135
Maestro 133
Manaccom 89
Microgram 15
Microland ..... 26 & 27
Microsoft ..... 47 & 49
Micro Educational .... 114 & 115
NetComm 99
Nu Age Window 16
OmniPage ..... 58 & 59
Pittwater Distributors 136
Procon 16
PC Extras 100
Ribbons, Rolls & Printers 78
Ritronics ..... 74 & 75
Sancom 137
Sarwax 87
Software Express 41
TIC Distribution 98
Two Series Software 141
UNI Systems 103
Vapourware 107
Wang ..... 90 & 91
Western Computers 81

SAVE TIME WITH HI-TECH C

HI-TECH C

is a high level language ideally suited to both hosted (e.g. DOS, Unix) and embedded applications, A C program can be written and debugged up to 5 or 10 times faster than the same program in assembler code. HI-TECH C is the optimum choice in C compilers for all the common microprocessor families. With more features, better diagnostics and smaller, faster code HI-TECH C will save you time in completing your project. Act now! Join the thousands of programmers world-wide who have discovered the benefits of HI-TECH C.

NEW FEATURES IN VERSION 5

- ☐ Source Level Debuggers
- ☐ Interrupt Functions
- ☐ I/O Port Variables
- ☐ Absolute Variables
- ☐ Far and Near Pointers
- ☐ Automatic Prototyping
- ☐ Far data
- ☐ Global Optimization
- ☐ Smaller Faster Code
- ☐ Parameters in Registers

FEATURES

- ☐ ANSI Standard C
- ☐ Compact Fast Code
- ☐ Complete Library
- ☐ Macro Assembler
- ☐ Linker and Librarian
- ☐ Cross Reference
- ☐ Full Library Source
- ☐ Execution Profiling
- ☐ Interrupt Support
- ☐ Floating Point Arithmetic
- ☐ Mathematical Functions
- ☐ Comprehensive Local Support
- ☐ 12 Months Free Updates

HOST OPERATING SYSTEMS

MS-DOS/PC-DOS
CP/M-86
SCO XENIX
ATARI ST
APPLIX 1616

GUARANTEED TO SAVE YOU TIME OR YOUR MONEY BACK

APPLICATIONS

- ☐ Robotics
- ☐ Remote Control
- ☐ Telemetry
- ☐ Process Control
- ☐ Lift Control
- ☐ Monitoring
- ☐ Space Applications
- ☐ Bionics

SUPPORTED PROCESSOR FAMILIES

8086/186/286
Z80/64180
68000/010/020
8096/80C196
8051/8031
6800/6801/68HC11/6301/6303
6809

NATIVE C COMPILERS

CPM-80	$195
MS-DOS	$300
CP-M 86	$300
ATARI ST	$250
APPLIX 1616	$250

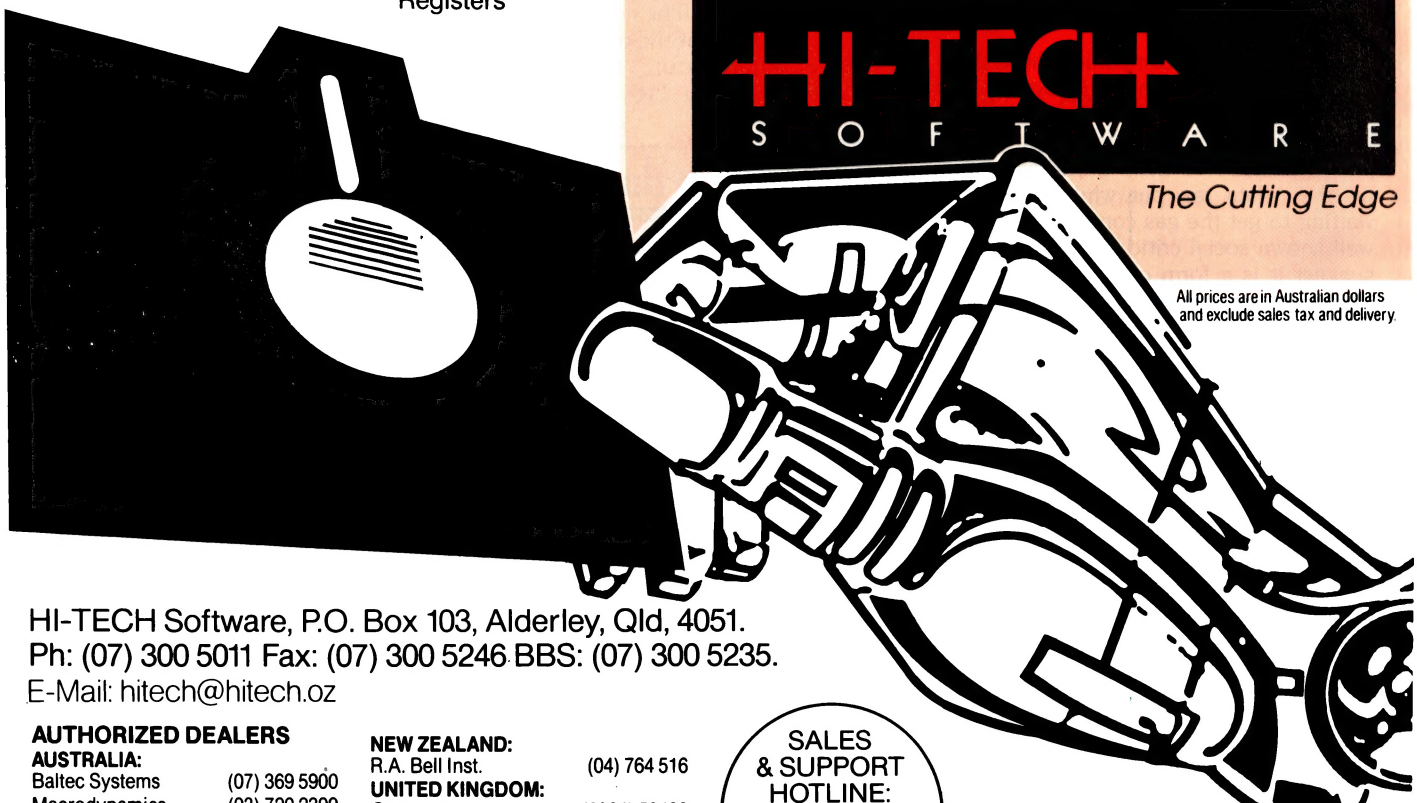
CROSS C COMPILERS

$495 — $895
DEPENDING ON TARGET AND HOST

HI-TECH SOFTWARE

The Cutting Edge

All prices are in Australian dollars and exclude sales tax and delivery.



HI-TECH Software, P.O. Box 103, Alderley, Qld, 4051.
Ph: (07) 300 5011 Fax: (07) 300 5246 BBS: (07) 300 5235.
E-Mail: hitech@hitech.oz

AUTHORIZED DEALERS

AUSTRALIA:

Baltec Systems	(07) 369 5900
Macrodynamics	(03) 720 2399
BJE Enterprises	(02) 858 5611
Esis Pty. Ltd.	(02) 467 2032
Program Development Systems	(03) 793 4698

NEW ZEALAND:

R.A. Bell Inst.	(04) 764 516

UNITED KINGDOM:

Greymatter	(0364) 53499

U.S.A.:

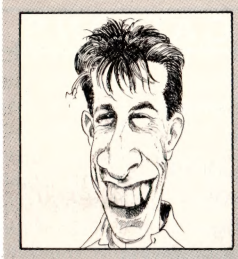
Z-World	(916) 753 3722

JAPAN

Southern Pacific	(043) 314 9514

SALES & SUPPORT HOTLINE:
008 777 935
OR
(07) 300 5011

CURSORY GLANCE



MICHAEL BURLACE

3.1415926536

■ The word 'robot' comes from the Slav word 'robotnik' meaning a serf. It was first used in a play by Karel Capek who died more than 50 years ago.

■ Want to know the value of pi to a million places? No? That's a pity because you've just missed out on a great 400-page book devoted to that subject.

■ The smallest unit you're likely to see in the metric system is the femtometre, femtogram etc. It is 0.000000000000001, or 10 to the minus 15 of the relevant metre, gram or tax cut if Paul Keating is giving it out. You are unlikely to use it as a unit of memory – the femtobyte. The way things are going you could end up with femtosecond access time for the replacement for that old-technology hard disk you've been using for years. But not for a couple of months at least.

■ Ring up lots of companies these days and you get put on hold. In Sydney the Gas Company (Australian Gas Light) has the toughest reputation for keeping people on hold, some claim that their leases on their flats ran out while they were waiting to get the gas connected. Jeremy, well known social critic, goes so far as to suggest it is a form of control, stopping people from moving house too often. Thank you Jeremy. His phone is now tapped as well, the other forms of control obviously haven't worked.

So, the time you are on hold has been labelled the productive pause, a marketing space and so on. And you thought it was just a pain in the butt. Smart companies used to be aware that this time was a nuisance to the caller and they tried to make their clients as comfortable as possible. Muzak, Mantovani and rock were common. Then came the radio station era.

Now the smart companies apparently use this space to market their products. They tell their customers that they have this item on special, have added that item to their stock list and so on. The theory is that the client will buy the service or product being advertised.

But the companies which are really smart employ someone for the same cost as the hold space communications consultant and call them a telephonist. They clear the backlog of calls, get people's messages to them and get the customers some satisfaction instead.

BOOTSTRAP: The latest weapon in Paul Keating's armory is the road tax. Not the one the truckies pay, nor the one the registration renewal collects. No, it's the new electronic one based on distance travelled, time of day and area covered.

Paul has decided that the only way to raise more money, save the ozone layer, restore the economy to some sort of apparent stability and pay for a new set of clocks is to hit the motorist harder. But don't worry, there will be no new forms to fill in, no extra slug at the pump. It will all be done automatically as you drive around. Paul will also slug you much more for driving in peak periods in the heavily-trafficked zones or in areas which are under traffic restrictions such as once-quiet suburban streets which they are trying to restore to that state.

First, your number plate will be replaced with an electronically-readable one and the computers on every intersection will know just where you've been and how much tax to slug you. Second, you'll find out how much when you get your monthly bank statement. The tax will already have been deducted. And if you don't want Paul sticking his and Bob's fingers in your till, you'll pay in advance. Third, there is no way around it.

Of course, there is a way round it. Take public transport, ride a pushbike or walk and really do something for the environment and yourself. □

LOGITECH

At last. A publishing program for normal people.

Normal people can't function with their heads stuck in a manual, so we developed a publishing program for IBM personal computers that hardly needs one.

Normal people want to see on paper what they saw on the screen, so we included full WYSIWYG and Bitstream's Fontware.™

And normal people have higher standards than budgets, so we included features that most people need, not what they don't. At a price that'll please anybody.

FINESSE

Craig Bruce—a mannequin dealer in Oakland, California—is normally far too busy to spend hours on his desktop publications.

Distributed by:
B.J.E. ENTERPRISES PTY. LTD.
35 West Parade,
Eastwood 2122
Tel: (02) 858-5611
Fax: (02) 858-5610

DELTACOM
AUSTRALIA

The power of 80386 computers built here in Australia.

The New Deltacom XT, AT & 386 machines offer performance, price and possibly the most marketable PCs to be released in Australia.

Call now for your nearest Deltacom dealer.

ALFA COMPUTERS PTY LTD

10 REGENT STREET,
SYDNEY 2000

Phone: (02) 281 2755 Fax: (02) 281 2765

DEALER ENQUIRIES WELCOME